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The International Summit on Science Technology and Humanity **ISETH2021**

*Enhancement of Academic Capacity to
Contribute Country Development*

20-21 December 2021





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Application The Aikipressure Techniques to Improve The Development of Children with Special Needs: A Qualitative Study

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ABSTRACT

Purpose: describe how to apply *aikipressure* techniques to improve the development of children with special needs in the development clinic health center, Sukoharjo, Central Java, Indonesia.

Methodology: a descriptive qualitative design. Determination of research subjects by purposive sampling includes the following criteria: 1) mothers who have children with special needs are members of the development clinic health center; 2) mothers who want to give acupressure therapy to their children; 3) mothers who are willing to be respondents; 4) mothers who are willing to provide data according to the research questions. The research was conducted in September-November 2021. The research site was in the development clinic health center, Sukoharjo, Central Java, Indonesia. The time of data collection was carried out for 1 month with monitoring carried out every 1 week. The *aikipressure* technique was carried out every day by the parents and accompanied by the research team.

Results: Interviews were conducted with 10 main informants, 1 key informant and 1 supporting informant. Characteristics of the main informants, namely 1 male informant and 9 female informants, aged between 27-44 years, the majority are housewives, the age of children is in the range of 2.5-14 years. Characteristics of informants based on the condition of the child, namely 1 child hydrocephalus, 5 children with cerebral palsy, 2 children with hyperactivity and 2 children with Down syndrome. The advantages of *aikipressure* are simple, effective and efficient.

Applications/Originality/Value: The novelty of this research is the application of *aikipressure* therapy in improving the development of children with special needs. *Aikipressure* therapy can be done by parents independently.

Keyword: aikipressure; development; children

INTRODUCTION SECTION

Developmental problems in children are common and require evaluation from the neurological aspect of the child. Therefore, early diagnosis and recognition the sign of developmental disorders is very important (Tjandrajani et al., 2012). The results of a study conducted in the United States reported that 15.1% of children under the age of 18 years (approximately 11.2 million) were estimated to have special health care needs. Overall, 23% of households in the United States have at least 1 child with special health care needs (Glassman, 2017).

The true prevalence of developmental delay is not known with certainty. The prevalence of delay increased with age in all domains. It is estimated that 5-10% of children experience developmental delays. The results of research conducted by (Tjandrajani et al., 2012) showed that among the 604 new patients evaluated, 187 (30.9%) patients with general developmental delays, 93 cases (49.7%) of them had a clear cause, namely congenital abnormalities, microcephaly, macrocephaly, epilepsy, sensory disturbances, integration, febrile seizures, encephalitis, cerebral palsy, congenital hypothyroidism, Down syndrome, history of asphyxia, and ADHD. The remaining 94 (50.3%) were without comorbidities, consisting of 62 (66%) males and 32 females. Men are at a higher risk of experiencing delays in communication, gross motor and social-personal development compared to women (Tjandrajani et al., 2012; Correia et al., 2019).

The impact of developmental delays is one of the limitations of body functions, including impaired breathing or respiration, swallowing or digestion, blood circulation, chronic physical pain including headaches, limited vision, hearing, etc. These limitations also include limitations in activities, movement, using hands, learning, understanding or paying attention, speaking or communicating (Glassman, 2017).

The most common causes of developmental delay are chromosomal abnormalities and brain malformations, but there are many other causes as well. General developmental delay in patients with significant physical abnormalities or a history of severe disease can be analyzed/assessed earlier, but this is more difficult in patients with normal physique and no history of severe disease or other comorbidities. If stimulation and intervention are carried out only based on the main complaint without assessing other developments, then the management of general developmental delay is not optimal, and this chief complaint often does not always reflect the actual situation. Appropriate intervention is needed to improve child development (Tjandrajani et al., 2012; Zhang et al., 2018).

This research was conducted as an effort to improve the development of children with special needs with a simpler method and focus on problem solving. The novelty of this research is the provision of *aikipressure* techniques in improving the development of children with special needs. *Aikipressure* is a form of developing massage methods for improving muscles, nerves and spine inspired by the Aiki Taiso movement (aikido movement technique), by rubbing, massaging, and pressing the body surface in order to support promotive, preventive and rehabilitative efforts. The advantages of *aikipressure* are simple, effective and efficient. This study discusses how the application of *aikipressure* techniques in improving the development of children with special needs. The discussion raised several research questions, including: 1) what are the advantages of *aikipressure* technique? 2) what are the disadvantages of *aikipressure* technique? 3) How was the condition of the child before being given *aikipressure* therapy? 4) how is the development of personal social, language skills, fine motor and gross motor skills in children after being given *aikipressure* techniques?. The purpose of this study was to describe how the application of *aikipressure* techniques in improving the development of children with special needs in the development clinic health center, Sukoharjo, Central Java, Indonesia.

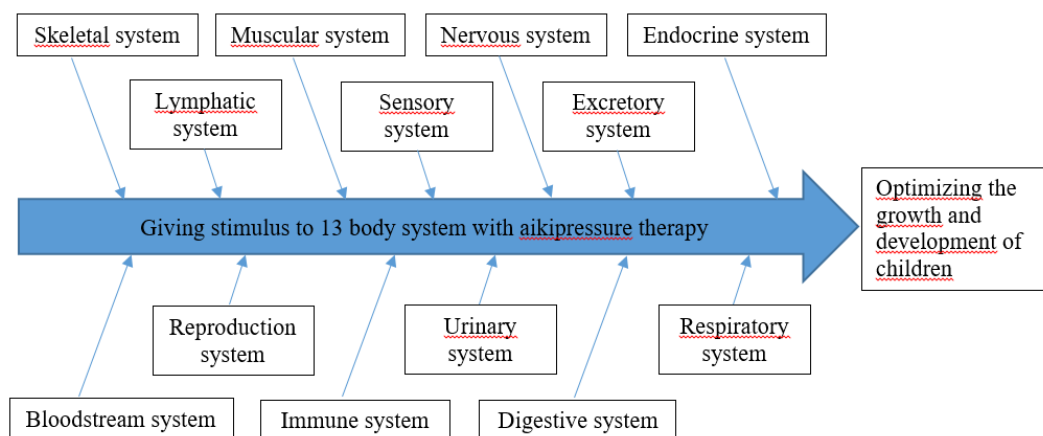


Figure 1. Fishbone research about about *aikipressure* therapy mecanism for optimizing children's growth and development

METHOD

This study used a descriptive qualitative design that produces descriptive data in the form of written and spoken words from people and observed behavior. This study describes how the application of *aikipressure* techniques in improving the development of children with special needs in the development clinic health center, Sukoharjo, Central Java, Indonesia.

Determination of research subjects was carried out by purposive sampling, namely the determination of research subjects according to the criteria and research objectives. The subjects of this research are parents who have children with special needs with the following criteria: 1) mothers who are members of the development clinic health center, Sukoharjo, Central Java, Indonesia.; 2) mothers who want to give *aikipressure* therapy to their children; 3) mothers who are willing to be respondents; 4) mothers who are willing to provide data according to the research questions. The focus of the qualitative research study was the feelings, experiences, meanings that parents get regarding the application of *aikipressure* techniques given to children with special needs.

The research was conducted in September-November 2021. The research site was in the development clinic health center, Sukoharjo, Central Java, Indonesia. The time of data collection was carried out for 1 month with monitoring carried out every 1 week. The *aikipressure* technique is carried out every day by the child's parents and accompanied by the research team. Qualitative data was collected by means of in-depth interviews and documents. The data collection instrument used observation sheets and interview guides. Qualitative data analysis was carried out in 3 stages, namely: 1) data reduction, namely summarizing, selecting the main points, focusing on the important things, looking for themes and patterns and discarding unnecessary ones; 2) data presentation; 3) conclusion or verification (Siyoto and Sodik, 2015; Yusuf, 2017; Anggito and Setiawan, 2018).

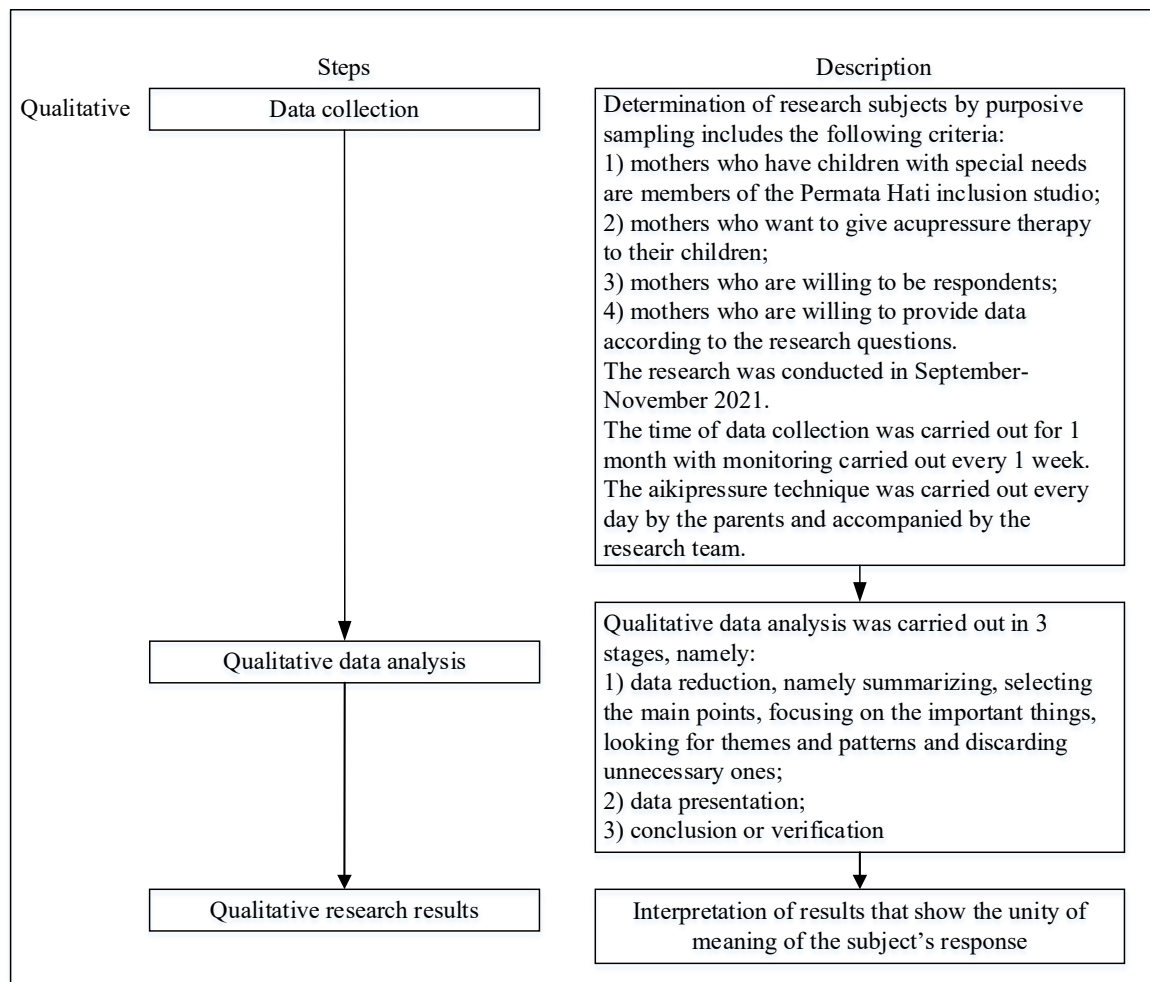


Figure 2. Research stages

RESULTS AND DISCUSSION

Interviews were conducted with 10 main informants, 1 key informant and 1 supporting informant. The main informant in this study is that parents can be represented by the father or mother of children with special needs. The key informant in this study was the leader of in the development clinic health center, Sukoharjo, Central Java, Indonesia. Supporting informants in this study are experienced health therapists in the field of pediatric therapists as well as formulators of aikupressure techniques. Key informants are informants who have comprehensive information about the problems that occur. Key informants not only know about conditions/phenomena in society in general but also understand information about key informants. The selection of key informants depends on the unit of analysis to be studied. Key informants should be people who are willing to share concepts and knowledge with researchers and are often used as a place to ask questions by researchers. Therefore, it is better to collect research data starting from key informants to get a complete and comprehensive picture of the problems observed. The main informants are people who know technically and in detail about the research problem to be studied. Supporting informants are people who can provide additional information as a complement to analysis and discussion in qualitative research. The main informants are people who know technically and in detail about the research problem to be studied. Supporting informants are people who can provide additional information as a complement to analysis and discussion in qualitative research. The main informants are people who know technically and in detail about the research problem to be studied. Supporting informants are people who can provide additional information as a complement to analysis and discussion in qualitative research (Adiputra et al., 2021).

Children with special needs are children who experience physical, mental, social and emotional disorders. Children with special needs show lower or higher physical, mental, social, intellectual and emotional characteristics than normal children of their age. This disorder is usually detected during pregnancy until an early age of growth and development. In Indonesia, with the fourth largest population in the world, has a large number of children with special needs. Indonesia does not yet have accurate and specific data on how many children with special needs are. However, children with special needs live in the midst of society in large numbers. Understanding the dynamics of life experienced by children with special needs, Monitoring growth and development and how the environment becomes a social agent that can support the existence of children with special needs is very important to pay attention to. Types of special needs of children vary based on the symptoms that appear. There are special needs children whose symptoms are obvious so that other people can know quickly that the child has special needs. There are also special needs with early symptoms that are difficult to see with the naked eye, the symptoms will only be known after interacting for a long time or after going through a series of examinations carried out. There are special needs children whose symptoms are obvious so that other people can know quickly that the child has special needs. There are also special needs with early symptoms that are difficult to see with the naked eye, the symptoms will only be known after interacting for a long time or after going through a series of examinations carried out. There are special needs children whose symptoms are obvious so that other people can know quickly that the child has special needs. There are also special needs with early symptoms that are difficult to see with the naked eye, the symptoms will only be known after interacting for a long time or after going through a series of examinations carried out (Cahyani, 2015; Desiningrum, 2016; Hodayah et al., 2019; Mirnawati, 2019).

Characteristics of the main informants by gender 1 informant is male and 9 informants are female. Characteristics of informants based on age are in the age range between 27-44 years. Characteristics of informants based on occupation, namely 1 informant works as a private employee, 1 informant works as a tailor, 8 informants are housewives. Characteristics of informants based on the age of the child are in the range of 2.5-14 years. Children are more than just little adults. Physically, mentally, emotionally they have unique needs, wants and boundaries. The toddler period is called the golden period and the critical period is a period of the most rapid growth and development in the human

brain. Toddler development will be optimal if the environment provides positive support or vice versa. General developmental delay or global developmental delay (GDD) is part of the inability to achieve age-appropriate development and is defined as a delay in two or more areas, including gross motor development, fine motor, speech or language, cognition, personal social and daily activities (Tjandrajani et al., 2012; Allen, 2013; Usman, Sukandar Hadyanan and Sutisna, 2014).

There are 5 informants who have children under five, namely ages ranging from 2.5 to 3.5 years, while 5 informants have children with ages ranging from 6-14 years. Since the child is born until the age of 5 years (golden age), is a period of important growth and development in the body. This period, which is commonly referred to as toddlerhood (under five years), is a period of vulnerability to factors that make children affected by disturbances in the process of growth and development. (Wihadi and Evijanty, 2017). Parents and therapists should have a basic understanding of child development, but what is more important is the willingness and flexibility to meet each child at their own stage of growth and development. This aspect of flexibility must be seen when providing therapeutic massage for children which can be expressed into 5 points, including permission, speed, pressure, positioning, and parents (Allen, 2013).

The results of interviews with supporting informants stated that *aikipressure* is a form of developing massage methods for improving muscles, nerves and spine inspired by the Aiki Taiso movement (aikido movement technique), by rubbing, massaging, and pressing the body surface in order to support promotive, preventive efforts, and rehabilitative. *Aikipressure* arises because the existing therapies seem complicated when learning it takes a lot of time because the discussion is related to problems that occur in bones, muscles, nerves and joints. This is supported by the theory that massage requires some basic preparation and techniques. The massage begins by creating a calm atmosphere. If possible, massage in a warm and quiet place, indoors or outdoors, removing jewelry. Massage is done in a comfortable position on the floor or bed or standing in front of the changing table and position the baby on a blanket or towel in front. Massage is done by controlling the touch when you first start massaging. Massage also uses a soft touch and adjusts to the condition of the body. Next, gently rub every part of the child's body including the head, neck, shoulders, upper back, waist, thighs, feet and hands and communicate during the massage (Anonim, 2020).

The results of interviews with main informants, key informants and supporting informants explained that the advantages of *aikipressure* were simple, using bare hands, effective and efficient. The disadvantage of *aikipressure* is that it requires the skill and sensitivity of the person who does it, in direct skin to skin contact, adjusting to the needs and comfort of the client so that in practice the amount of pressure given adjusts to the client's condition. Another disadvantage of *aikipressure* is that the aikipressure technique requires perseverance from parents and the willingness to be able to do therapy for their children on a regular basis. This is in accordance with research conducted by Alen (2013) which states that there is no general rule about the amount of pressure that should be used on children. One may find the strong touch soothing, while for others it may be painful. The same mild pressure that soothes one child to sleep can be very torturous for other children with amusement. It is important to meet each client, case by case, and day by day. The child has the right to have control over the amount of pressure applied. Building trust with the child is just as important as the massage itself and it may also take an entire session just to build trust. After the trust is well established, the child will be able to relax and enjoy the massage given. In general, most child massages are done fully clothed. This allows the therapist to focus more on the client's comfort and safety. The same light pressure that soothes one child to sleep can be very torturous for other children with amusement. It is important to meet each client, case by case, and day by day. The child has the right to have control over the amount of pressure applied. Building trust with the child is just as important as the massage itself and it may also take an entire session just to build trust. After the trust is well established, the child will be able to relax and enjoy the massage given. In general, most child massages are done fully clothed. This allows the therapist to focus more on the client's comfort and safety. The same mild pressure that soothes one child to sleep can be very torturous for other children with amusement.

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The results of interviews with main informants and key informants revealed that their children had hydrocephalus, Down's syndrome, cerebral palsy, speech impairment, hearing loss, history of leaky heart, and non-symptomatic epilepsy. Massage therapy has a positive effect on several conditions of the child. These include premature growth, psychological problems including aggression, digestive problems including constipation and diarrhea, painful conditions including burns and sickle cell, impaired muscle tone including cerebral palsy and Down syndrome, and chronic diseases including diabetes, asthma and HIV. Massage is part of treatment with touch therapy using certain techniques. The main points around massage are 1) baby massage is a global practice; 2) the existing evidence base is methodologically limited, therefore, difficult to draw conclusions to inform clinical practice; 3) Health professionals need to be careful in recommending topical oils for massage until it is known about their effects on infants or children (Cooke, 2015; Field, 2019; Risa Sanputri, Ellyanti and Author, 2019).

The results of interviews with key informants explained that the 10 main informants were parents who actively took their children to the development clinic health center, Sukoharjo, Central Java, Indonesia. Key informants also have children with special needs. Her son is 8 years old and has hydrocephalus since birth. The child has undergone surgery 4 times but the results have not been as desired. Every day the fluid in his head is increasing, causing his head to get bigger. The condition of children before aikipressure therapy often experienced spastic and tense muscles. The condition after aikipressure therapy is rarely spastic, the eyeballs begin to focus and do not protrude too much, the muscles begin to flex and are easier to move, the child also looks more comfortable after aikipressure therapy. This is reinforced by the theory that one of the physical characteristics of children with mental retardation is suffering from hydrocephalus. Hydrocephalus is a large, fluid-filled head (Cahyani, 2015).

The results of interviews with 1 main informant whose child has hydrocephalus since he was 4 years old (now he is 6 years old) but is not accompanied by an enlarged head. The results of a CT scan showing fluid in the head. The condition of the child before the aikipressure therapy was stiff, sat not upright, could not walk, did not want to learn to walk, always gripped his hand, often shook (shalore). The condition after the aikipressure therapy is no longer working, the legs are more flexible, the hands are still gripping, they are willing to be invited to learn to walk even though their legs are still crossed, the child is more cooperative and responds better when invited to communicate with other people. This is reinforced by the theory that explains that hydrocephalus occurs when the production and absorption of brain fluid is not balanced, In children, it will cause symptoms in the form of headaches, memory loss or concentration, nausea and vomiting, visual disturbances,

impaired body coordination, balance disorders, and difficulty holding urination. Ten to fifteen percent of patients with hydrocephalus can initially develop without clinical signs, such as enlargement of the head (Musi and Nurjannah, 2021).

Hydrocephalus is a physiological disorder of cerebral spinal fluid resulting in abnormal expansion of the cerebral ventricles. Infants generally present with progressive macrocephaly whereas children older than 2 years generally present with signs and symptoms of intracranial hypertension. The most common surgical treatment for hydrocephalus is a ventriculoperitoneal shunt. Postoperative complications include infection, blockage, drainage abnormalities and mechanical failure (Estey, 2016; Kahle et al., 2016).

The results of interviews with 5 main informants who have children with special needs with 3 children at the age of toddlers and 2 children over the age of 5 years. The children were diagnosed with cerebral palsy from the age of 6 months to 1 year. In one of the children who are over 5 years old, cerebral palsy is experienced accompanied by non-asymptomatic epilepsy symptoms. Conditions prior to aikipressure therapy included stiff legs, unable to bend, inactive hand movements, palms gripping, fingers close together, restlessness, a lot of movement and undirected movements. The condition after aikipressure therapy is that the legs can begin to bend, they are willing to be invited to learn to walk, the feet are swinging, the hand movements are active, the hands are not gripping, the stiffness is reduced, the fingers are not attached. The results of observations on children with special needs after therapy with aikipressure showed a faster development in children aged under five than those over the age of five. This is supported by several research results which state that children with cerebral palsy not only experience disturbances in motor function but most of them experience health problems, such as sensory, cognitive, behavioral, language, epilepsy and secondary musculoskeletal problems. This form of spastic paralysis is often found in children with cerebral palsy, in about 70%-75% of cases. Spasticity will increase muscle tone and cause muscle stiffness and impaired function and muscle atrophy. Currently there is no treatment that can be used to treat cerebral palsy. However, most children with cerebral palsy survive into adulthood. Cerebral palsy is expected to become a public health problem in the future (Soebandi et al., 2017)

The results of interviews with 2 main informants who have children with special needs with hyperactive motor disorders aged over 5 years. In addition to hyperactivity, one of the children has problems with his vocal cords and hearing loss, namely his left ear is completely deaf. The condition before the aikipressure therapy was carried out was that the child did not want to stop his activities, was very active, never felt tired, if he was going to be treated, he did not want to and moved a lot, his ears did not want to be touched. The condition after the aikipressure therapy made the child calmer, more responsive when asked to communicate, more controllable, has begun to be treated, his ears can be held, and after every aikipressure therapy the child falls asleep.

The results of interviews with 2 main informants who have children with special needs with Down syndrome at the age of 2.5 years. The condition before the aikipressure therapy was carried out, the child could not walk, only stood for a while then fell, the vocabulary spoken was not clear. The condition after aikipressure therapy was able to walk, the walk became smoother, began to be able to stand by lifting 1 leg, throw and kick a ball, the fingers began to be active, could play well with friends, the vocabulary that was spoken became clearer and increased, such as saying said father, mbah, sis, maem.

The benefits of massage include: 1) improving the relationship between mother and baby or child; 2) regular massage can increase the activity of the vagus nerve which connects the neck, heart, lungs, and stomach to the brain, including the digestive system; 3) increase body weight, nervous system stability and disease resistance; 4) maximize the baby's brain development, promote muscle development in the neck, shoulders, arms, and back as well as overall neurological; 6) maximize the baby's brain development, promote muscle development in the neck, shoulders, arms, and back as well as overall neurological; 7) increase the baby's sleep duration; 8) optimize baby's growth and development; 9) increase the frequency and duration of breastfeeding in infants. Massage is also

beneficial in stimulating and regulating physiological processes such as breathing and digestion, restore the balance of the body, balance the nervous system and hormones. Massage can also be a means of conveying attention, acceptance, support and empathy (Gürol and Polat, 2012; Hidayah, Wahyuningsih and Firrahmawati, 2018; Pratami, Risa Wahyuningsih and Firrahmawati, 2018; Saputri, Wahyuningsih and Kamidah, 2019; Sari Puspita, Wahyuni and Wahyuningsih, 2019; Anonim, 2021; T Prianti, Darmi and Kamaruddin, 2021)60 in the control group.

The results of interviews with supporting informants that aikipressure can improve personal social development, language and motor skills of children with special needs. Aikiperssure with personal social development is based on the concept that energy is circular. Circulation of energy flows throughout the body through the circulation of blood vessels. If the circulation is not smooth it will cause health problems and decreased organ work, such as speech delays, walking delays, etc. Children who have difficulty speaking experience blockage of energy from the energy center (stomach) to the mouth and brain. The main pathways that are blocked are in the neck and shoulder areas, while on the peripheral nerves the blocked areas are under the jaw, below the mouth, and above the mouth. There are also speech limitations stemming from hearing limitations. Aikipresure with motor development is based on blockages that block the flow of blood and energy throughout the body, especially in the muscles that support the spine. This concept occurs in both gross and fine motor delays. The muscles around the spine experience tension so that it blocks the central nervous system. If the central nervous system is repaired, the peripheral nerves will also improve so that their motor skills can develop optimally.

The way *aikipressure* works begins with the concept that one of the keys to a healthy body is smooth blood circulation, because blood is responsible for distributing oxygen and nutrients to all body tissues. Blood circulation that is not smooth, can cause various symptoms and health problems. How aikipressure works on the body by providing stimulation to maintain, restore and optimize the skeletal system, muscular system, circulatory system, digestive system, nervous system, respiratory system, immune system, lymphatic system, excretory system, urinary system, reproductive system, sensory system and endocrine system. The meaning of health based on aikipressure is to return to nature. The various meanings of fitrah include thuhr (holy), Islam (safe), monotheism (confessing the oneness of Allah), sincere (pure),

The results of interviews with key informants showed that the frequency of massage performed by the informants varied. There are those who routinely do it once a day, 1-2 times a day and 2 times a day, but there are also those who only adjust the conditions of the informants and their children. Factors that influence the behavior of parents in this study are divided into 2, namely supporting factors and inhibiting factors. Supporting factors, among others, motivation within the informant so that their children have better development, the support from the environment. While the inhibiting factors include busy parents, children who do not want to be treated, children who cannot be self-treated, and no support from the surrounding environment, especially from the family. The results of interviews with supporting informants that ideally aikipressure therapy is carried out 1-2 times a day by parents on a regular basis to get maximum results, and if the therapist does it, it is enough once every 3 days. Overall health and health disparities are shaped significantly by non-medical factors. It includes individual characteristics, such as education, income, health beliefs and others. In addition, many things come from the social and physical context of individuals and families, schools, workplaces, the environment and the political economy of the larger society. It includes individual characteristics, such as education, income, health beliefs and others. In addition, many things come from the social and physical context of individuals and families, schools, workplaces, the environment and the political economy of the larger society. It includes individual characteristics, such as education, income, health beliefs and others. In addition, many things come from the social and physical context of individuals and families, schools, workplaces, the environment and the political economy organization of the larger society (Short and Mollborn, 2015)we review applications of the widely applied 'social determinants' approach to health behaviors. This approach shifts the lens

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The Relationship between Gender, Age, and Knowledge with Safety Riding Behaviour at Productive Age in Java Island

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ABSTRACT

According to World Health Organization (WHO) in the 2018 Global Status Report on Road, the number of deaths due to traffic accidents in the world increases to 1.35 million cases every year. In Indonesia, traffic accidents are also a serious problem and increasing every year. Therefore, this study aims to determine the relationship between gender, age, and knowledge with safety riding behaviour at productive age in Java. A descriptive study with a cross sectional study design was chosen to analyse. This research was conducted from March–October 2021. The population in this study were all users or riders of two-wheelers and four-wheelers of productive ages on Java Island. The research samples are 774 respondents with random sampling. Data were analysed using univariate analysis and bivariate analysis with chi-square test. The results of the study showed that the number of male respondents was 51.8%, age > 30 years was 53.1%, good knowledge was 54.4% and good safety riding behaviour was 63.7%. The results of statistical tests showed that there was a significant relationship between gender (OR 1.78 1.32-2.40), age (OR 1.72 1.28-2.32), knowledge (OR 2.59; 1.92- 3.50) with safety riding behaviour. It is recommended that the government and related parties provide more frequent socialization and education related to driving safety, especially for adolescents, young adult and women.

Keywords: safety, riding, accident

INTRODUCTION

Deaths and accidents caused by traffic are global problem and show an increasing trend. According to the World Health Organization (WHO) report in the 2018 Global Status Report on Road, the number of deaths due to traffic accidents in the world w 1.35 million. These data show that deaths caused by traffic accidents are higher than HIV/AIDS, tuberculosis, and diarrhea. 93% of deaths are from Middle low – income countries.(World Health Organization (WHO), 2018) In addition to death, accidents also cause material losses, minor injuries, and serious injuries.(Djaja, Widyastuti, Tobing, Lasut, & Irianto, 2016; Halim, Adisasmita, Ramli, & Aly, 2017)

In Indonesia, traffic accidents are also a serious problem and are increasing every year. Report from the Indonesian National Police, the number of traffic accidents in 2019 increased by 3% compared to 2018.(Ramadhan, 2019) The results of the analysis of traffic accidents in Indonesia in 2010-2014 show that the highest types of vehicles involved in traffic accidents are motorcycles and both cars. The highest proportion of traffic accidents is in West Java, Central Java, East Java, DKI Jakarta, and North Sumatra.(Djaja et al., 2016) Meanwhile, data analysis of the National Transportation Safety Committee (NTSC) in 2007-2016 shows that the highest time of traffic accidents (44%) occurred during productive hours, namely 12.00-18.00.(Dwi, 2017)

WHO states that the highest number of deaths from traffic accidents is in the age range of 5-29 year-old.This shows that children and adolescents are an age group that ignores driving safety.(World Health Organization (WHO), 2018) Meanwhile in Indonesia, the results of the analysis of traffic accidents in Indonesia in 2010 - 2014 show that the highest number of traffic accident victims is in the productive age range, namely the age of 26-30 years as many as 343,743 people. Furthermore, the second highest number of victims is the age group of 16-25 years with a total of 102,881 victims. (Djaja et al., 2016) Thus, adolescents and productive age are the largest groups contributing to traffic accidents.

Adolescence is the beginning of an interest in trying motorized vehicles even though their knowledge of driving is still lacking so they are often ignorant of traffic rules and driving safety. (Alamsyah, 2013) Productive age, vehicles are important for the high need for mobilization. However, high mobility without being accompanied by good driving knowledge is at risk of having a traffic accident. Research shows private employees are the highest number of traffic accidents. Then followed by school students or university students. (Djaja et al., 2016) By gender, women are less skilled at driving than men because women are more likely to be passengers than drivers. (Haryanto, 2016) Therefore, this study aims to determine the relationship between gender, age, and knowledge with safety riding behaviour at productive age in Java.

METHOD

This research is a descriptive study with a cross sectional study design. This research was conducted from March – October 2021. The population in this study were all users or drivers of two-wheeled and four-wheeled adolescents and productive ages on the island of Java. While the research sample is 774 respondents. Determination of the number of samples is determined by using the proportion estimation test formula and sampling based on random sampling. The inclusion criteria used were adolescents and productive age, drivers of two-wheeled or four-wheeled vehicles and residing on the island of Java. This research has passed the ethics test at the Health Research Ethics Commission STIKES Indonesia Maju No. 741/Sket/Ka-Dept/RE/STIKIM/VIII/2021.

The data collected is the characteristics of the respondents, driving knowledge and safety riding behavior. Each of the elements of driving knowledge and safe riding behavior is measured using 15 questions that have been validated and reliable. Data was collected directly from respondents using a google form questionnaire that was distributed online via the link <http://bit.ly/Roda2Roda4>, which was disseminated using WhatsApp's. Data management, which includes data coding, data editing, and data cleansing, is carried out once the data collected is sufficient. There were 858 people that filled out the survey, however only 774 of them completed it entirely. Furthermore, based on the mean value, data analysis of driving safety knowledge and safety riding conduct was divided into two categories (good and poor). The average level of driving safety knowledge is 8.6, while the average level of riding safety conduct is 9.0. Using the IBM SPSS Statistics tool, the data was also examined univariate and bivariate with chi-square tests.

The description of the characteristics of research respondents can be seen in Table 1.1 below:

Table 1.1 Characteristics of Respondents (n = 774)

| Characteristics of Respondents | | Amount (n) | Percentage (%) |
|--------------------------------|---------------|------------|----------------|
| Domicile | DKI Jakarta | 154 | 19,9 |
| | Banten | 59 | 7,6 |
| | Jawa Tengah | 50 | 6,5 |
| | Jawa Timur | 166 | 21,4 |
| | Jogjakarta | 22 | 2,8 |
| | Jawa Barat | 323 | 41,7 |
| Gender | Man | 401 | 51,8 |
| | Woman | 373 | 48,2 |
| Age | < 30 Y | 363 | 46,9 |
| | ≥ 30 Y | 411 | 53,1 |
| Vehicle | Motor | 524 | 67,7 |
| | Car | 74 | 9,6 |
| | Motor and car | 176 | 22,7 |

| Characteristics of Respondents | | Amount (n) | Percentage (%) |
|--------------------------------|------|------------|----------------|
| Knowledge | Poor | 353 | 45,6 |
| | Good | 421 | 54,4 |
| Safety Riding Behaviour | Poor | 281 | 36,3 |
| | Good | 493 | 63,7 |

Based on table 1.1, it is found that 51% of respondents are male and domiciled in West Java (41.7%). Most of the respondents are 20-30 years old (50.1%). Most respondents ride motorbikes (67,7%). Good knowledge of respondents is 54.4% and good safety riding behaviour is 63.7%

The results showed that 54.4% of respondents had a good understanding of driving safety. This means that more than half of the respondents have good knowledge of driving safety. Knowledge of driving safety is a provision that must be possessed before driving a vehicle related to mastery of abilities, control skills, mentality, and attitude. With knowledge of driving safety, it will familiarize someone to be more careful in driving a vehicle.(Wahyuningsih & Ramdana, 2020) Previous research in Medan City also found that more than half of the respondents (55%) had knowledge of good driving behaviour.(Manurung, Sitorus, & Rinaldi, 2019)

Table 1.2 below shows the findings of the bivariate analysis.

Table 1.2 The relationship between gender, age, and knowledge with driving safety behaviour (*safety riding*) (n=774)

| Variable | | Safety Driving Behaviour | | | | Total | | OR (95% CI) | P value |
|-----------|-------|--------------------------|------|------|------|-------|-----|------------------|---------|
| | | Poor | | Good | | | | | |
| | | n | % | n | % | n | % | | |
| Gender | Woman | 161 | 43,2 | 212 | 56,8 | 373 | 100 | 1,78 (1,32-2,39) | 0,001 |
| | Man | 120 | 29,9 | 281 | 70,1 | 401 | 100 | | |
| Age | <30 Y | 156 | 43,0 | 207 | 57,0 | 363 | 100 | 1,72 (1,28-2,32) | 0,001 |
| | ≥30 Y | 125 | 30,4 | 286 | 69,6 | 411 | 100 | | |
| Knowledge | Poor | 170 | 48,2 | 183 | 51,8 | 353 | 100 | 2,59 (1,92-3,50) | 0,001 |
| | Good | 111 | 26,4 | 310 | 73,6 | 421 | 100 | | |

Based on table 1.2, it is found that there are as many as 43.2% of female respondents who have lack driving safety behaviour. The results of statistical tests obtained p value = 0.001 so that there is a significant relationship between gender and driving safety behaviour. From the results of the analysis, the value of OR = 1.78 (1.32-2.39), which means that female respondents have a 1.78 times chance of having lack of driving safety behaviour compared to male respondents.

The results showed that women were more at risk of having lack driving behaviour than men. According to Haryanto (2016) men have better driving skills than women. Women's skills in driving are also inseparable from social roles in society, where the presence of a woman often acts as a passenger compared to the main driver when she has a partner.(Haryanto, 2016)

Based on table 1.2, the results show that there are 43.0% of respondents aged <30 years have lacked driving safety behaviour. The results of statistical tests obtained p value = 0.001 so that there is a significant relationship between age and driving safety behaviour. From the results of the analysis, the value of OR = 1.72 (1.28-2.32), which means that respondents aged <30 years have a 1.72 times risk of having a lack of driving safety behaviour compared to respondents aged >30 years.

The results showed that respondents aged <30 years were more at risk of having lack driving behaviour than respondents aged >30 years. According to Haryanto (2016) young drivers have

minimal experience in driving. The existence of experience in driving leads to the extent to which the driver's ability to control the vehicle, both in normal conditions and in sudden conditions that require a quick response. In addition, young drivers are less mature in carrying out risk assessments so they tend to dare to take risky decisions such as driving at high speed, overtaking other vehicles, and violating traffic rules without paying attention to the impact they will bear.(Haryanto, 2016) Research conducted by Manurung also shows that there is a relationship between age and behaviour safety riding.(Manurung et al., 2019)

Results show that there are 48.2% of respondents with a lack of knowledge have lack driving safety behaviour too. Statistical test results obtained p value = 0.001 so that there is a significant relationship between knowledge and driving safety behaviour. From the results of the analysis, the value of OR = 2.59 (1.92 - 3.50) which means that respondents with a lack of knowledge have a 2.59 times chance of having lack driving safety behaviour compared to respondents who have good knowledge.

The results of this study indicate that there is a significant relationship between knowledge and driving safety behaviour. Respondents who lack knowledge are 2.59 times more likely to have lack driving safety behaviour than respondents who have good knowledge. Aulia's research also shows that there is a relationship between knowledge and safety riding on online motorcycle taxi drivers in Semarang City.(Aulia, Kurniawan, Wahyuni, Masyarakat, & Diponegoro, 2020) Likewise with research conducted on high school students and university students in the city of Semarang.(Eni Mahawati, 2013)

Knowledge is one of the factors that influence a person's behaviour. Someone who has extensive knowledge will be wiser in making decisions or actions. Increased knowledge will encourage a person's awareness to act based on the knowledge possessed.¹⁰ Thus, respondents who have good driving safety knowledge will be more likely to behave or act safely in driving than respondents who have lack knowledge.

CONCLUSION

The results of the study showed that the number of male respondents was 51.8%, age > 30 years was 53.1%, good knowledge was 54.4% and good safety riding behaviour was 63.7%. The results of statistical tests show that there is a significant relationship between gender, age, and knowledge with safety riding behaviour.

SUGGESTION

It is recommended that the government and related parties often increase safe driving campaigns such as providing counselling, socialization, training, distributing brochures, and so on to increase adolescents and young adults knowledge and awareness about the importance of safety riding behaviour, especially adolescents and young adults as well as to women. Other researchers are expected to examine differences in knowledge and safety riding behavior between two-wheeled and four-wheeled riders.

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Nonvital Root Canal Treatment of Necrotic Maxillary Left Lateral Incisor: A Case Report

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ABSTRACT

A dental fracture or cracked tooth is a break or crack of a tooth fragment which is usually caused by traumatic injuries or attack. Traumatic injuries to the tooth can affect the pulp so that the tooth becomes necrosis (nonvital). Root treatment is one of the treatments for pulp disease by removal of the pulp from the root canal and filling the canal with obturation material. The goal is to prevent transmission of the pulp to the periapical tissue, or if it has occurred, to alter or return the periapical tissue to its normal state. This case report discusses root canal treatment of a nonvital tooth in a 31 years old female patient with fracture tooth. The treatment plan is root canal treatment which consists of three main stages that are biomechanical preparation of the root canal, root sterilization with calcium hydroxide, and obturation. Obturation of the root canal using lateral condensation technique with gutta percha material and endomethasone sealer. The success of root treatment requires knowledge of the root canal and the quality of obturation as well as the final restoration.

Keywords: Root canal treatment, fracture, calcium hydroxide, nonvital

INTRODUCTION

A dental fracture or cracked tooth according to the American Dental Association (ADA), is a break or crack of a tooth fragment which is usually caused by traumatic injuries or attack. Tooth fracture usually occurred from mild (involving *chipping* of the outer tooth layers called enamel and dentin) to severe (involving vertical, diagonal, or horizontal fractures of the root). Dental trauma can involve the pulp so that the tooth becomes necrosis (nonvital) (Walton and Torabinejad, 1996)

A nonvital tooth or pulp necrosis or pulp tissue death is an irreversible condition characterized by destruction of the pulp tissue (Widyastuti and Suparno, 2019). Pulp necrosis can be partial or complete. Pulp necrosis is caused by bacterial infection at the pulp. Pulp necrosis can also result from a traumatic injury in which the pulp is damaged before an inflammatory reaction occurs. This condition causes ischemic infarction development and a necrotic pulp with dry gangrene. Necrosis that occurs due to dental trauma usually occurs in a short time or a few weeks. Basically the process is the same, namely there is a change in blood circulation in the pulp which ultimately causes pulp necrosis (Grossmann et al, 1995)

Root canal treatment is one of the treatments for pulp disease by removing vital or necrotic pulp from the root canal and replacing it with a filling material. The goal is to prevent the extension of disease from the pulp to the periapical tissue, or if it has occurred, to change or return the periapical tissue to a normal state (Widyastuti, 2017)

Root canal treatment can be divided into three stages, there are biomechanical preparation of the root canal (cleaning and shaping), sterilization and obturation of the root canal. Biomechanical preparation is the removal of pulp tissue by extirpation of vital and necrotic tissue. The ideal root canal preparation includes 4 stages, there are determining the direction of the root canal, cleaning the root canal, shaping the root canal and preparing the apical area. This step is followed by instrumentation, irrigation and sterilization of the root canal and obturation (Nisa et al, 2013).

Hermetic root canal obturation is the main requirement for successful root canal treatment, this can be achieved if the root canal is prepared and sterilized properly. The idea of obturation is to prevent the entry of microorganisms into the root canal through the coronal, prevent the multiplication

of microorganisms that are left behind, prevent the entry of tissue fluid into the pulp through the apical foramen because it can be a medium for bacterial growth (Soedjono et al, 2019)

CASE PRESENTATION

A 31 years old female patient presented with a complaint of a fracture front tooth since 2 years ago due to an accident, currently the patient does not complain of pain in her teeth and the tooth has never been treated. The patient had no suspected systemic history and did not have any allergies to food, drugs or weather.

Extraoral examination revealed no abnormalities. Intraoral examination revealed the presence of 22 teeth fractured in the incisal, sound (-), percussion (-), palpation (-), vitality (-) with OHI 1 (good) (fig. 1a, 1b). The periapical radiograph revealed a horizontal fracture of 1/2 crown on tooth 22 (fig. 2).

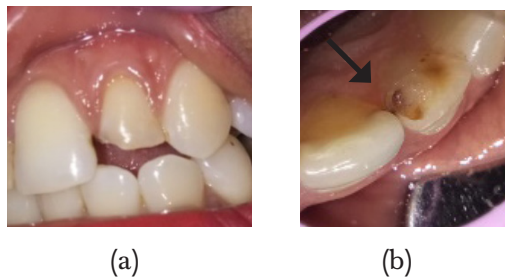


Figure 1. a). Clinical features of the 22 labial teeth; **b).** Clinical features of the 22 palatal teeth



Figure 2. Radiographic image of 22 horizontal fractures of 1/2 crown

DIAGNOSIS AND ETIOLOGY

The diagnosis of tooth 22 was Ellis Class IV fracture with pulp necrosis. The treatment plan is root canal treatment. Dental trauma cause pulp necrosis in several weeks. Pulp necrosis basically occurs due to changes in blood circulation in the pulp which ultimately leads to pulp necrosis. Dental trauma can cause obstruction of the main blood vessels at the apex and subsequently result in dilatation of the capillaries in the pulp. Pulp capillary dilatation is followed by capillary degeneration and then pulp edema, lack of collateral circulation in the pulp, partial or total ischemia of the pulp and cause the pulp response to inflammation is low. This allows bacteria to penetrate into the small blood vessels at the apex. All of these processes can lead to pulp necrosis.

TREATMENT AND RESULTS

The first visit begins by explaining about the condition of the patient teeth and the plan treatment and the treatment duration. After the patient agreed and signed the informed consent, it was followed by a periapical X-ray of tooth 22 to measure the estimated working length on the X-ray.

The second visit is root canal preparation. The first step is to prepare tools and materials. Isolate the work area with a rubber dam (fig. 3a), then widen the canal so that the instrument can enter

without a hitch with a round diamond bur (fig. 3b), looking for orifices using a smooth broach, take pulp tissue (pulp debridement) using a barbed broach until the canal is really clean. The root canals were irrigated using 2.5% Sodium Hypoclorite (NaOCl) and dried using a sterile paper point.

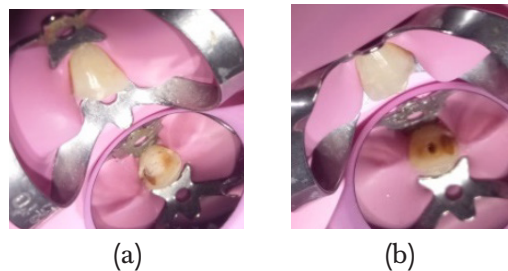


Figure 3. a). Isolate the work area with a rubber dam; **b).** after widening the canal with a round diamond bur.

The working length is measured by estimating the working length of the radiograph to be confirmed using a k-file inserted along the estimated working length, then a periapical x-radiograph was performed and the working length was 19.5 mm (figure 4).



Figure 4. Radiographic measurement of working length

After getting the working length, the root canal preparation was done with the step back method, starting with the determination of the initial file (IAF #20) followed by apical preparation to obtain the master apical file (MAF #35) and preparation of the root canal body (fig. 5a). Every change of file, root canals were irrigated with 2.5% Sodium Hypoclorite (NaOCl) solution (fig. 5b). Root canal dressing was performed using calcium hydroxide paste + glycerin iodine, inserted with a lentulo with a low speed handpiece until the root canal was completely filled and then filled with cavt temporary filling material (figure 5c).

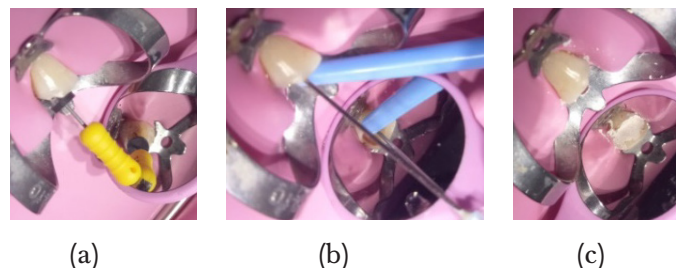


Figure 5. a). root canal preparation; **b).** irrigation using 2.5% NaOCl. ; **c).** temporary filling with cavt.

The patient came one week later to continue treatment. The patient had no complaints and the bacterial test using Hydrogen Peroxide (H₂O₂) was negative. Subjective and objective examination was done. Then, radiograph examination was done for the measurement of the Master Apical Cone

(MAC) using gutta percha according to the length of the Master Apical File (MAF) (fig. 6). Then, obturation of the root canal using gutta percha and endomethasone sealer with lateral condensation technique (MAC #35) (fig. 7a). The gutta percha was inserted into the canal until hermetic and radiograph was performed to determine the obturation result (fig. 7b). After the obturation results were declared hermetic, the excess gutta-percha was cut with a plugger that was heated to the extent of the orifice, temporarily filled with Zinc Phosphate (figure 7c).



Figure 6. MAC Measurement

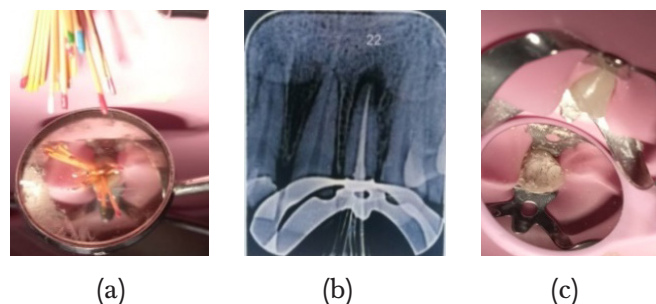


Figure 7. a). root filling. ; b). Radiograph of the results of the obturation. ; c). Temporary filling results with Zinc Phosphate

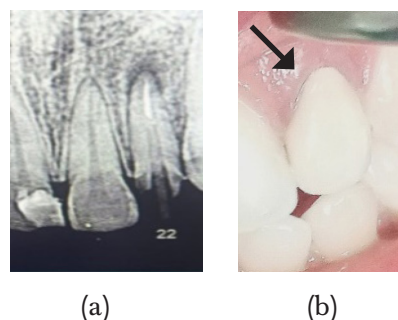


Figure 8. a). Photographic try-in fiber post. ; b). The final result of the jacket crown restoration

The patient came one week later to determine the success of the treatment. We performed subjective and objective examination of the patient and the result was that the patient had no complaints, percussion (-) and palpation (-) and the temporary filling was still in good condition. The final restoration in this treatment was a porcelain fused to metal jacket crown with Fiber Reinforced Composites post core retention (Figs 8a, 8b).

DISCUSSION

Treatment on tooth 22 diagnosed with Class IV Ellis Fracture with pulp necrosis has been successfully carried out with nonvital root canal treatment. The necrosis tooth occurred due to a

fracture that has reached the pulp. Periapical radiographs showed periapical lesions which indicated that the tooth was necrotic, so root canal treatment of nonvital teeth was the most appropriate treatment option for this case.

Root canal preparation is one of the most important parts of root canal treatment. In root canal preparation, it is the process of cleaning and shaping the root canal. The preparation technique used is the step back technique starting from the apical preparation then proceeding towards the corona. The advantage of using the step back technique is that it is more effective in cleaning the root canal, makes obturation easier and the filling is denser because the spreader can penetrate close to the apex (Widastuti, 2017)

Root canal preparation will not be complete without irrigation. NaOCl is the most commonly used irrigating agent today. In the root canal irrigation procedure, NaOCl will dissolve the collagen in the root canal dentin so that it is easy to prepare. Its antibacterial action is obtained in several ways, including by releasing free oxygen which combines with protoplasmic cells so as to damage the cells, the combination of Cl₂ with cell membranes to form N-chloro compound which will interfere with cell metabolism, and mechanical damage to cells by Cl₂ and Cl₂ oxidation in enzymes so it inhibits enzymes work and result in the death of microorganisms (Mulyawati, 2011).

The use of calcium hydroxide Ca(OH)₂ as a sterilization material in root canal treatment has been around for a long time. Ca(OH)₂ is an effective root canal medicament because it has broad-spectrum antibacterial properties, is biocompatible with tissues, reduces periapical tissue inflammation, and can stimulate hard tissue formation. Ca(OH)₂ has a working action through the release of Ca²⁺ ions which play a role in the process of tissue mineralization and OH⁻ ions which can provide an antimicrobial effect through increasing pH, thus forming an alkaline environment that is not suitable for the development of microorganisms (Ingle, 2002). When applied in root canals, Ca(OH)₂ decomposes into Ca²⁺ ions and OH⁻ ions which will then diffuse through the dentinal tubules. With its alkaline nature, most of the microorganisms present in infected root canals cannot survive (Ariani and Hadriyanto, 2013).

Root canal obturation is a key principle of endodontic triad treatment. Obturation is the final step after the procedure of removing infected tissue from the root canal and sterilization, and forming the pulp chamber. The choice of root canal obturation material is one of the important factors in determining the success of endodontic treatment. Gutta percha is the most commonly used core material. The advantages of using gutta-percha are that it is plastic, easy to manipulate, has minimal toxic effects, is radiopaque and is easily removed by heat or solution (Mardewi, 2009).

The success of root canal treatment is a good achievement in the treatment according to the specified criteria. For teeth that have been necrotic, the success of root canal treatment is to remove bacteria in the root canal so that the resulting periradicular lesions can recover. Endodontic treatment is said to be successful if there are no complaints and the teeth are functional. The criteria for success in general include no pain or swelling in the treated tooth, no clinical symptoms and the tooth can return to physiological function and the radiograph features in the apex area normal (Zaleckiene, 2014).

CONCLUSION

Pulp necrosis that occurred in the upper left lateral incisor in this case was treated with a nonvital root canal treatment. After being treated with an evaluation for 1 week, the patient stated that there were no complaints about the treatment, objective examination found temporary fillings in good condition, no swelling, percussion (-), palpation (-) thus indicating that the root canal treatment had been successful. However, further evaluation still needs to be done.

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Functional Properties of Instant Yellow Rice of Gembili Tubers (*Dioscorea esculenta*) to Improve Food Security

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ABSTRACT

Gembili tubers have sufficient carbohydrate content compared to other tubers. Gembili tubers contain bioactive compounds that can be beneficial for the body. The antioxidants contained in gembili tubers are phenol, diosgenin, and dioscorin. Dietary fiber is also contained in gembili tubers which can provide benefits for the body such as overcoming diabetes, preventing digestive disorders, lowering cholesterol levels. These tubers can be processed into tuber flour, starch, and composite flour. In addition, this tuber can be used as an alternative non-rice food source. Turmeric as a colorant for instant yellow rice of gembili tubers which contains antioxidants, anti-inflammatory, antimutagenic, anticancer, and antimicrobial properties. So far, no one has made instant yellow rice made from gembili tubers.

Purpose: The research is aimed to determine the content of antioxidants activity and dietary fibers in instant yellow rice from gembili tubers with different drying temperature variations of 70°C, 80°C, and 90°C.

Methodology: The experiment of instant yellow rice was conducted using a single-factor Completely Randomized Design (CRD) method with temperature variations of 70°C, 80°C, and 90°C for three hours. Testing of dietary fiber using the multienzyme method and testing of antioxidant activity using the RSA IC₅₀ method. The research was carried out in two treatment replications with two laboratory analyzes. Furthermore, the obtained data were analyzed using the One-Way ANOVA test, and if the results showed a treatment effect, then proceed using the DMRT test with $\alpha = 5\%$.

Results: The results of this study showed that the dietary fiber content of instant yellow rice from Gembili tubers had no effect on variations in drying temperature with $p = 0.685$ ($p \geq 0.05$). However, based on three different temperature treatments, the highest dietary fiber content was at 70°C temperature treatment, which was 10.8047%. Whereas antioxidant activity tests on instant yellow rice of Gembili tubers indicated that there was an effect of drying temperature variations on antioxidant activity with $p = 0.001$ ($p < 0.05$). The variation of the drying temperature of 90°C shows the highest antioxidant activity, which is 6162,7008 ppm. The lower of the drying temperature, so the lower of the level antioxidant activity.

Applications/Originality/Value: This diversification product of instant yellow rice of gembili tubers is expected can support the national food security program by reducing rice consumption rate without causing substantial change in the tradition of the Indonesian people.

Keywords: gembili tubers, turmeric, instant yellow rice, antioxidant, dietary fiber

INTRODUCTION

Rice (*Oryza sativa*) is the main source of carbohydrate in the dietary habit in Indonesian. The increasing of rice consumption rate in Indonesia has unsurprisingly become the key factor to the import of rice every year. The highest amount of rice import by the Indonesian government occurred in 2018, with ballooning figure of 2,253,000 tonnes (BPS, 2019). This dependency of the Indonesians to rice will undoubtedly rise concern about food security in the archipelago nation. Food security in Indonesia can be upgraded by increasingly harnessing local comestibles other than rice. Indonesia is home to numerous varieties of non-rice local food ingredients such as corn, cassava, sweet potato, sorghum, sago, and many others (BKP, 2020). Tuber is one of carbohydrate-rich commodities, yet is still not widely explored in Indonesia. Tuber is local ingredient that needs more proper preservation and utilization. According to the Indonesian Food Security Agency (BKP), the consumption of tubers family in 2018 is as follows: cassava (9.5 kg/capita/year), sweet potato (3.4 kg/capita/year), potato (2.4 kg/capita/year), sago (0.4 kg/capita/year) (BKP, 2018). Compared to the data from 2018, tuber's

consumption experiences a decline. The result above urges an improvement in tubers consumption in order to become an alternative source of carbohydrate to rice. Gembili tubers are one of the tubers that are often found in Central Java but are still underutilized. Therefore, one of the innovations that can be produced to increase the use value and consumption level of gembili tubers is to process them into processed food products.

One of the lesser-known tubers in Indonesia with undoubted nutrients and benefits is gembili tubers (*Dioscorea esculenta*). Gembili is highly beneficial for human body because it contains bioactive compounds. The tuber's utilization can be obtained by turning it into tuber flour, starch, or composite flour. Every 100 grams of gembili, with edibility rate of 85%, contains 131 kcal of energy, 1.1 g of protein, 0.2 g of fat, 31.3 g of carbohydrate, 1.1 g of fiber, 56 mg of phosphor, 0.6 mg of iron, 14 mg of calcium, as well as 4 mg and 0.08 mg of vitamin C and vitamin B1, respectively (Izwardy D et al., 2017). Gembili has eminence contents of bioactive compounds in the forms of diosgenin, dioscorin, inulin (Masrikhiyah, 2019) and also has insoluble fiber in the shape of cellulose, as well as little lignin and hemicellulose. The function of these antioxidant compounds is as an antidote to free radicals (Mar'atirrosyidah & Estiasih, 2015). It possesses tuber flour and starch yields of 21.40% and 24.28%; the highest among other tubers. The yields of gembili have profound potential to be produced as flour or starch (Sabda et al., 2019).

Indonesians' basic food needs of "nasi" (cooked rice, simply "rice" here forward) is irreplaceable for now. Rice is still the main, must-consume comestible for Indonesian. There several types of rice consumed in Indonesia, including nasi uduk, nasi liwet, and nasi kuning (Abidjulu et al., 2015). Nasi kuning (yellow rice) is basically made of rice grains, turmeric, alongside many other ingredients and spices. Yellow rice has long been a part of the main food of Indonesian society. Yellow rice is usually consumed in the morning, afternoon, and evening. Although previously yellow rice was only consumed in certain cultural traditions such as thanksgiving, weddings, and birth (Indriani, 2012). Therefore, yellow rice is familiar to the people of Indonesia. So this product is an innovation from yellow rice with the basic ingredients of gembili tubers.

Turmeric, that gives the cuisine its iconic yellow colour, contains curcumin compounds, which is a polyphenol compounds that acts as antioxidant, antiinflammation, antimutagenic, anticancer, and antimicrobe (Hewlings & Kalman, 2017). Turmeric mixed in nasi kuning yields beautiful and appealing appearance. Other than that, turmeric is also beneficial for human health (Auza & Tasse, 2015).

One of the efforts that can be carried out to reduce rice dependency in Indonesia is food diversification by processing gembili tubers into instant yellow rice. The production cycle of instant yellow rice of gembili tubers is divided into two processes; the flouring of gembili tubers and the making of instant yellow rice with temperature variations of 70°C, 80°C, 90°C. Drying process also has effects on nutrient content; the level of nutrient content decrease in a foodstuff due to heating depends on the type of ingredient and temperature used, which can affect the quality of the food (Sundari, 2016). This research aims to measure the effect of temperature variations on antioxidant and fiber contents of instant yellow rice of gembili tubers. This diversification product of instant yellow rice of gembili tubers is expected to support the national food security program by reducing rice consumption rate without causing substantial change in the tradition of the Indonesian people.

RESEARCH METHODS

Materials

The materials used in the flouring process are gembili tubers (obtained from Sambi traditional market, Boyolali), Na-Bisulphite and salt. Ingredients for the making instant yellow rice of Gembili tubers include gembili tuber flour, turmeric (obtained from Kleco traditional market, Surakarta), sodium triphosphate (STPP), alginate, calcium chloride, cooking oil, dan aquadest. Ingredients for fiber level analysis are phosphate buffer pH 7, alpha amylase enzyme, distilled water, HCl solution 1N,

pepsin enzyme, NaOH solution 1N, beta amylase enzyme, ethanol, acetone, ethanol 95%. Ingredients for antioxidant activities analysis are 1,1,2,2 –Diphenyl Picrylhydrazyl (DPPH) solution and methanol.

Research Stages

1. Flouring of Gembili Tubers

Gembili used for flouring in this research were 5 – 10 cm long with diameter of 2 – 3 cm. The flouring process was based on the methods by Winarti et al., (2017) with modifications. The process was begun by peeling and slicing the tubers by thickness of 2 – 3 mm, soaking in Na-Bisulphite and salt for 6 – 8 hours, drying in the sun for 3 – 4 days, milling to make flour, and sifting using 80-mesh sieve.

2. Making of Instant Yellow Rice of Gembili Tubers

The making of instant yellow rice of Gembili tubers consisted of several steps based on the research by Arifiani, Rizky dan Sulandari (2016) with modifications. First step was manually mixing dough by hands for 15 – 20 minutes until it became smooth and homogenous. The mixture consisted of 200 grams of gembili flour, 0.4 grams of STPP, 4 grams of alginate, 0.2 grams of calcium chloride, 20 grams of cooking oil, and 100 ml of aquadest. Next, adding 20 grams of liquid turmeric extract which was previously gained by grating peeled and washed turmeric, mixing it with 100 ml of aquadest, then filtering the final yellow mixture. The dough was then manually moulded into the shape of rice. Finally, instant yellow rice of Gembili tubers was dried in the oven (with temperature variations of 70°C, 80°C, and 90°C for 3 hours).

3. Dietary Fiber Analysis of Instant Yellow Rice of Gembili Tubers

The quality testing of instant yellow rice of Gembili tubers included functional characteristics testing of dietary fiber content. Dietary fiber content testing was conducted using the Gravimetry/Multienzyme methods (AOAC, 2006).

4. Antioxidant Activity Analysis of Instant Yellow Rice of Gembili Tubers

The quality testing of instant yellow rice of Gembili tubers included functional characteristics testing of antioxidant activity was done using the DPPH RSA IC₅₀ (Radical Scavenging Activity) methods.

Research Design

This is experimental research using single-factor Completely Randomized Design (CRD) method with three temperature variations drying. The treatment variation lies in the applied temperatures of 70°C, 80°C, and 90°C. The experiment is repeated two times for each treatment. Each repetition is given two times of analysis.

Statistical Analysis

Statistical analysis is then conducted to the laboratory results of normality and homogeneity tests. If the data turns out normal and homogenous, then the One-Way ANOVA test is carried out; and if there is any effect of treatment, then data is proceeded using the DMRT test with $\alpha = 5\%$.

RESULT AND DISCUSSION

Instant Yellow Rice of Gembili Tubers

Figure 1 is the result of the first experiment and Figure 2 is the result of the second experiment of making gembili tubers instant yellow rice with different drying temperature variations of 70°C, 80°C, and 90°C, where in the picture the plate on the left is an instant yellow rice product with a drying temperature of 70°C, the middle plate use 80°C, and the plate on the right use 90°C.



Figure 1. Instant Yellow Rice of Gembili Tubers Experiment I



Figure 2. Instant Yellow Rice of Gembili Tubers Experiment II

Total Dietary Fiber of Instant Yellow Rice of Gembili Tubers

Dietary fiber is carbohydrate and lignin which cannot be hydrolysed by human digestive enzymes. Codex Alimentarius Commission (CAC, 2009) defines dietary fiber as carbohydrate polymers with ten or more monomer units which cannot be digested or absorbed by human small intestines and falls into these three categories: (i) naturally edible carbohydrate polymers in edible foods, (ii) edible carbohydrate polymers from physical, enzymatical, or chemical food raw materials and have beneficial physiological effects that have been scientifically proven and generally accepted, (iii) synthetic edible carbohydrate polymers with have beneficial physiological effects that have been scientifically proven and generally accepted. Total Dietary Fiber (TDF) consists of soluble dietary fiber (SDF) and insoluble dietary fiber (IDF). Soluble dietary fiber is dietary fiber that can be dissolved in water. Whereas insoluble dietary fiber is dietary fiber that cannot be dissolved in water (Santoso, 2011).

Table 1. shows the results of total dietary fiber tests instant yellow rice of gembili tubers with three drying temperature variations in two experiments. The results show that lower drying temperature in the making of instant yellow rice of Gembili tubers leads to higher dietary fiber content.

Normality tests concluded that data were normally distributed since the value of $p = 0.2$ ($p > 0.05$). While homogeneity tests indicated that data were homogenous since the value of $p = 0.23$ ($p > 0.05$). Furthermore, the One-Way ANOVA test showed values of $p = 0.685$ ($p \geq 0.05$) that implied there was zero effects of different temperature treatments to the dietary fiber content.

Table 1. Dietary Fiber by Treating Variations in Drying Temperature on Instant Yellow Rice of Gembili Tubers

| Temperature Variations | Dietary Fiber (%) | <i>p</i> |
|------------------------|-------------------|----------|
| | 1 | |
| 70°C | 10,8047 | 0,685 |
| 80°C | 10,4329 | |
| 90°C | 10,3649 | |

The One-Way ANOVA test conducted on three drying temperatures in the process of making gembili instant yellow rice showed that the highest dietary fiber content occurred on 70°C temperature treatment, whereas the 90°C treatment returned the lowest fiber content occurred. This result falls in line with a study by (Sandrin et al., 2019) the effect of extrusion temperature and screw speed on the nutritional properties of the extrudates was evaluated by using a response surface methodology. The total, soluble, insoluble dietary fiber, beta-glucan, resistant starch, and total starch contents were evaluated through enzymatic assays. The processing parameters affected the content of all constituents of the flour mixture, except for beta-glucan. The total starch content, insoluble dietary fiber, and resistant starch were significantly decreased with increasing temperature and screw speed (until 13, 12, and 97%, respectively, which dealt with temperature applied in the extrusion process to prepare fiber-rich oat flour, that found that higher temperature will simultaneously decrease dietary fiber content. Two years later, a research by Sumardiono et al. (2021) presented that drying temperature on extrusion methods of making analogue rice with the highest dietary fiber content found on 90°C, compared to other temperature treatments of 50°C and 70°C. The fiber content decrease was caused by decay on the cell wall of the analogue rice during the extrusion process. The fiber content rise happened due to decrease of water content on the analogue rice which evaporated during the extrusion process. However, other compounds' content such as carbohydrate increased which led the dietary fiber content to increase as well.

The fiber content on the instant yellow rice of Gembili tubers with three different temperature treatments produced the value of 10.3649% to 10.8047%. So that it is safe to say that instant yellow rice of Gembili tubers is high-fiber food. According to CAC (2009), high-fiber food contains minimum dietary fiber of 6%, while food to be categorized as fiber source needs to contain minimum dietary fiber of 3%. Raw gembili tubers have a dietary fiber content of 1.1 g in every 100 g with an edible weight of 85% (Izwardy D et al., 2017). If calculated in percent, gembili tubers have 6,386% dietary fiber (Pratiwi et al., 2016). So that the dietary fiber in instant yellow rice of Gembili tubers is higher than raw gembili tubers.

Dietary fiber has plenty benefits such as providing longer feeling of fullness, controlling body weight, and reducing fat content by binding it in small intestines (Herminingsih, 2010). Muchtadi (2000) as cited in Nurdjanah & Elfira (2009) wrote that dietary fiber can increase water content in colon that can prevent cancer, as well as form softer and bigger feces that can prevent diverticular disease.

Previous studies on dietary fiber using the gravimetric test showed that higher temperature will reduce dietary fiber content. Instant yellow rice of Gembili tubers, that falls into analogue rice category, has higher fiber content of 5.35% to 6.14% than that of sosoh rice Elleuch et al as cited in Noviasari et al. (2015). It can be concluded that instant yellow rice of Gembili tubers can be categorized as high-fiber food for its high dietary fiber content. According to recommendation of American Dietetic Association (ADA), daily dietary fiber consumption for adults is 20 – 35 g/day. Moreover, dietary fiber will also reduce the risk of cardiac disease if consumed more than 25 g/day (CAC, 2009).

Dietary fiber is a polysaccharide compound that is not easily digested by digestive enzymes which is then fermented in the intestine. Dietary fiber is related to the glycemic index value of a food ingredient, the higher the dietary fiber the lower the glycemic index value. Gembili is a tuber that has high dietary fiber, which is 6.386% (Winarti et al., 2017). The advantages of gembili are that they contain bioactive compounds, namely inulin which is a soluble dietary fiber and high dietary fiber, the inulin content in gembili tubers is 14.77% which is high when compared to other types of tubers. Inulin can be used as a prebiotic. Prebiotics are types of food fiber that are not digested by digestive enzymes but are fermented by microflora in the large intestine and will have a good effect on body health, one of which can facilitate digestion (Winarti et al., 2017). Research on the prebiotic activity of gembili tuber inulin was carried out with the foam mat drying method. Inulin drying was carried out using a temperature of 60°C for 3 hours and the results showed that the value of prebiotic activity was

high. The fiber content contained in gembili tubers based on the processing method. Foresters carry out processing of gembili tubers by boiling, frying, and steaming, then the processed products are analyzed for fiber content using the enzymatic method. The results of this study showed the highest fiber content in fried gembili, where the content of insoluble dietary fiber was higher than the content of soluble dietary fiber.

Antioxidant Activities of The Instant Yellow Rice of Gembili Tubers

Antioxidant is chemical compound that gives out one or more electron to free radicals to hinder them to react. Other explanation describes antioxidant as a compound that can prevent or hinder oxidation on an oxidated substance (Mar'atirrosyidah & Estiasih, 2015). Antioxidant is divided into two types which are enzymatic and nonenzymatic antioxidants. The enzymatic antioxidant is an antioxidant that has characteristics of prevention, while nonenzymatic antioxidant is an antioxidant that can break the chain caused by lipid peroxidation processes. Antioxidants found in gembili tubers are phenol, diosgenin, and dioscorin. Phenol is secondary metabolite with single aromatic ring and contains one hydroxyl group or more. The mechanism of phenol compound in donating electrons is called phenol acting as antioxidant. Diosgenin is an antioxidant that increases DNA lymphocytes' resistance to damage against oxidative compounds, anti-aging activities, cholesterol and fat secretions from within bile, and is also able to inhibit the growth of cancer cells. Dioscorin is a water-soluble alkaloid compound. This compound acts as immunomodulatory and is able to hold up angiotensin converting enzyme (ACE) which translates to causing increase in blood pressure Shajeela as cited in Mar'atirrosyidah & Estiasih (2015).

Table 2. shows results gained from two antioxidant activities tests of instant yellow rice of Gembili tubers on each of three drying temperature variations. The results indicate that lower drying temperature applied in the making of instant yellow rice of Gembili tubers resulted in lower antioxidant activities content. Antioxidants are compounds that can counteract free radicals and prevent degenerative diseases (Najihudin et al., 2017). Antioxidants have curcuminoid compounds that function as anti-inflammatory, antihepatotoxic, antitumor, and can lower body cholesterol. The phenolic components in turmeric can prevent cancer growth (Salim et al., 2017).

The normality tests showed that data were normally distributed since the value of $p = 0.051$ ($p > 0.05$). Whereas homogeneity tests concluded that data were homogenous since the value of $p = 0.242$ ($p > 0.05$). Then, the One-Way ANOVA tests returned the value of $p = 0.001$ ($p < 0.05$) which indicated that there were effects of drying temperature variations to the antioxidant activities of instant yellow rice of Gembili tubers. As the data suggests, the highest antioxidant activities among the three temperature treatments was on the drying temperature of 90°C.

Table 2. Antioxidant Activity by Treating Variations in Drying Temperature on Instant Yellow Rice of Gembili Tubers

| Temperature Variations | Antioxidant Activity (%) | |
|------------------------|--------------------------|------------------------|
| | 1 | 2 |
| 70°C | | 7136,4835 ^a |
| 80°C | 6354,2963 ^b | |
| 90°C | 6162,7008 ^b | |

According to the Duncan test, there was no significant distinction between 80°C and 90°C temperature variations, while the 70°C temperature showed different result. It means that the doughs with strongest antioxidant activities were the results of 80°C and 90°C drying temperatures, because smaller IC_{50} value means higher antioxidant activities (Widyasanti et al., 2016).

Molyneux (2004) wrote that lower IC_{50} value indicates higher antioxidant activities. Very strong antioxidant activities category has $IC_{50} < 50$ ppm, strong has IC_{50} 50 – 100 ppm, intermediate has IC_{50} 100 – 150 ppm, weak has IC_{50} 150 – 200 ppm, and very weak has $IC_{50} > 200$ ppm. Results obtained from the aforementioned experiments showed that instant yellow rice of Gembili tubers possesses very weak antioxidant activities with $IC_{50} > 200$ ppm. However, drying temperature of 90°C applied to the rice showed higher antioxidant activities than other treatments of 70°C and 80°C. In this product, turmeric is added as an additive to natural dyes. The result of antioxidant activity in yellow rice is 6162,7 ppm, while raw turmeric has an antioxidant of 40-200 ppm (Gayatri & Sahu, 2011).

The coloring of instant yellow rice of Gembili tubers used turmeric liquid diluted with aquadest. According to (Khatun et al., 2006), turmeric is one of spices with high antioxidant activities and its phenol content can be extracted using ethanol 20%. Research done by Boeing et al. (2014) explained that extraction using organic solvent and water is more effective than using water alone. It is because of the polarity level suitability between anthocyanin and mixture of ethanol and water. Whereas water solvent is very polar. Palleros (1993) as cited in Setyowati & Suryan (2014) that water can dissolve various organic compounds with 5 carbon chains or less as well as inorganic compounds due to its high polarity. While ethanol has medium polarity that can dissolve organic compounds.

This research is not in accordance with the study by Cahyani et al. (2019) about temperature and Ambon banana peel flour drying time variations against antioxidant activities. In her experiments, higher temperature led to antioxidant activities decline due to heating that caused antioxidant compounds to become sensitive to high temperatures.

Antioxidants can be found in plants containing high polyphenol compounds, such as turmeric (Tristantini et al., 2016) and plants containing bioactive compounds, such as gembili tubers (Mar'atirrosyidah & Estiasih, 2015). Antioxidants in turmeric, namely curcuminoid compounds function as anti-inflammatory, antihepatotoxic, antitumor, and can lower body cholesterol. The phenolic components in turmeric can prevent cancer growth (Salim et al., 2017). The antioxidants contained in gembili tubers are in the form of bioactive compounds, including phenol, diosgenin, and dioscorin. The function of these antioxidant compounds is as an antidote to free radicals (Mar'atirrosyidah & Estiasih, 2015).

Research from (Agustikawati et al., 2017) regarding the antioxidant activity of turmeric powder extract related to temperature and drying time with the DPPH test method showed the highest antioxidant activity at a temperature of 40°C with a drying time of 18 hours, while drying at a temperature of 60°C for 10 hours had the highest antioxidant activity value. Antioxidant activity was higher than the temperature of 50°C for 14 hours. Similarly, research from (N.E.W.D.S et al., 2020) on the effect of drying time on flakes made from gembili tuber flour and purple sweet potato which tested antioxidant activity with the DPPH test method showed the highest antioxidant activity results in an oven for 40 minutes at a temperature of 150°C. The comparison of time used is 40 minutes, 45 minutes, and 50 minutes.

CONCLUSION

One of the efforts that can be carried out to reduce rice dependency in Indonesia is food diversification by processing gembili tubers into instant yellow rice. Variations in temperature treatment in the making instant yellow rice of Gembili tubers did not show any effect on dietary fiber content with $p = 0.685$ ($p \geq 0.05$). Whereas antioxidant activity tests on instant yellow rice of Gembili tubers indicated that there was an effect of drying temperature variations on antioxidant activity with $p = 0.001$ ($p < 0.05$). Variations in drying temperature affect the antioxidant activity of 6162,7008 ppm at a temperature of 90°C. This temperature is the best temperature in the research results of instant yellow rice of Gembili tubers.

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Extraoral Radiography as an Alternative During Covid-19 Pandemic

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ABSTRACT

Purpose: The purpose of this literature review was made as a recommendation radiography materials for dental practitioners to use extraoral radiography as an alternative during the Covid-19 pandemic.

Methodology: This literature review is created by collecting journals and case reports with keywords “extraoral radiography” and “Covid-19 pandemic”. The inclusion criteria used in this articles review are articles published in English and Bahasa Indonesia, scopus indexed articles and research articles, and also from dental radiology books.

Results: Some dentistry organizations have suggested using extraoral radiography examinations as an alternative during the Covid-19 pandemic. These include panoramic, CBCT, extraoral bitewing and extraoral periapical radiography.

Applications/Originality/Value: Using extraoral radiography with panoramic, CBCT, extraoral bitewing and extraoral periapical radiography can be used as an alternative in radiography examination during the Covid-19 pandemic.

INTRODUCTION

The emergence of Covid-19 disease caused by the SARS-CoV-2 virus has affected all aspects of human life. One of the spread of SARS-CoV-2 is through the transmission of oral droplets and aerosols that are very closely related in dentistry. Dental practitioners and staff who participate in dentistry activities have a high risk of SARS-Cov-2 virus transmission (Little et al., 2020).

Air contamination caused by aerosols is mostly obtained from dentistry activities, such as: the use of ultrasonic scallers when scaling, the use of high speed handpieces during preparation, the use of water / air syringe, and intraoral radiography (Anu Sushanth et al., 2020). These activities need to be controlled and limited during the Covid-19 pandemic. The world dental organization has agreed on the application of limitations to the practice of dentistry and follows the guidelines that have been recommended by the Centers for Disease Control and Prevention (CDC). However, in its application radiography dentistry is still very limited for the control of SARS-Cov-2 transmission (Macdonald et al., 2020).

Radiography examination in dentistry is a very important action to establish a diagnosis in certain cases. Dental radiology practitioners are prone to exposure to sars-cov-2 virus transmission, because saliva contamination and oral droplets occur in this activity. Especially during intraoral radiography retrieval, where the radiographer needs to adapt the film into the patient's oral cavity so as to stimulate salivary secretion from the patient. So the use of extraoral radiography is more filtered during the Covid-19 pandemic. The statement was also delivered by the “Pengurus Pusat Ikatan Radiologi Kedokteran Gigi” (PP IKARGI) at the beginning of the Covid-19 pandemic which advised to postpone intraoral radiography examinations and only using extraoral radiography examinations (Lubis & Rahman, 2020).

Extraoral radiography is a technique of taking radiography from outside the patient's mouth. Image detectors and X-ray machines are placed outside the patient's mouth. This condition minimizes the occurrence of saliva contamination and oral droplets when taking radiography images. This literature study aims to provide several alternatives that can be used by dentistry practitioners when they need a radiography picture with minimal salivary transmission and oral droplets (Dave et al., 2020).

REVIEW

SARS-Cov-19 spreads directly, indirectly, or in close contact through the secretion of saliva and respiratory droplets released from those infected. Aerosol (a.k.a air solution) is the suspension of fine-solid particles or liquid droplets in the air. The virus has been shown to survive in free air for hours and on the surfaces for days. The symptoms of Covid-19 are fever or chills, cough, shortness of breath or difficulty breathing, weakness, muscle or body pain, headache, loss of sense of taste and smell, stuffy or watery nose, nausea, vomiting, and diarrhea. Identification of these symptoms needs to be suspected by dental practitioners when screening on patients who will perform dental care. However, in its application is often found Covid-19 positive patients without having these symptoms. Therefore, it is necessary for dental practitioners to assume that everyone who comes is a person at risk in the transmission of SARS-Cov-19 (Lubis & Rahman, 2020).

The beginning of the Covid-19 pandemic, dental radiography activities are not allowed because they do not include dental emergency. However, dental radiology is one of the most important supporting examinations in dentistry. Dental radiography examination has 2 types, namely intraoral and extraoral radiography. Intraoral radiography has a higher risk of SARS-Cov-19 transmission due to saliva contamination than extraoral radiography. Therefore, during the Covid-19 pandemic dental radiology activities are recommended using extraoral radiography (Cascante-Sequeira et al., 2020).

Radiography examination in dentistry has a high potential in the transmission of SARS-Cov-19. So, dental practitioners need to do infection control to prevent the transmission of SARS-Cov-19 and choose an alternative extraoral radiography examination that has a minimal risk of SARS-Cov-19. Some of the findings of extraoral radiography in this review literature are expected to be an alternative for dental practitioners during the Covid-19 pandemic (Ilhan et al., 2020).

This literature review presents some extraoral radiography that can be used as an alternative to intraoral radiography during the Covid-19 pandemic. The methodology of this literature review by collecting journals and case reports with keywords “extraoral radiography” and “Covid-19 pandemic”. The inclusion criteria used in this articles reviewed were articles published in English and Bahasa Indonesia, scopus indexed articles and research articles, and also from dental radiology books found that panoramic, CBCT, extraoral bitewing and extraoral periapical can be used as an alternative to dental radiography examination during the Covid-19 pandemic.

Panoramic

Panoramic radiography is a type of extraoral radiography that is often used and recommended by dentists that shows the whole of the upper jaw, lower jaw, and supporting tissue in one image. Panoramic radiography has two methods: conventional and digital panoramic radiography. Conventional panoramic radiography is a method of radiography with the process of printing film manually. Digital panoramic radiography is a method of radiography that is not shot using film. The film is replaced by an electrostatic device that sends images to the computer so that it can be directly visible on the monitor screen (Bella et al., 2020).

The success of the results of panoramic radiography is from the patient's position where the patient needs to stand with his shoulders upright, back straight and legs tight. In addition to the position of the body parallel to the Frankfort field with the chin positioned on the chip cup, the patient is instructed to bite the bite block and the tongue is pressed on the palate. Once the patient's position is ready, the image tube and receptor (film or digital sensor) will rotate around the patient's head simultaneously (Figure 1) (Rondon et al., 2014).

The advantage of used panoramic radiography are it can display an overall picture of the curved teeth, upper and lower jaw bone, and other anatomical structures in a single image (Figure 2) (Izzetti et al., 2021). The use of panoramic radiography can minimize the occurrence of contact saliva secretions from patients so as to reduce risk of SARS-Cov-2 transmission (Dave et al., 2020). However, panoramic radiography has a disadvantage where the existence of a superimposition structure causes

errors in interpreting the panoramic radiography picture and the deformation of the image that makes the lack of size accuracy produced (Widyastuti & Suparno, 2019). And often, the occurrence of errors due to the placement of the patient's head when taking panoramic radiography that make the resulting image not good enough (Abdinian et al., 2015).



Figure 1. The patient's position during of the panoramic radiography (Pandarakalam & Khalaf, 2014).



Figure 2. The image of panoramic radiography (Izzetti et al., 2021)

Cone beam computed tomograph (CBCT)

Cone beam computed tomography (CBCT) is a type of extraoral radiography that produces 3D imaging. CBCT produces minimal imaging distortion so that visualization of anatomical structure shape and size is close to accurate. CBCT imaging uses tomography reconstructed through projections from the opposite direction through the rotation of cone-shaped x-ray rays (Figure 3) (Ruetters et al., 2020). The position of taking CBCT can be shown on taking panoramic radiography (Figure 4).

The use of CBCT has advantages in imaging dentistry including 3D images that has a high degree of accuracy and easy in image acquisition, lack of appearance of artifacts, lack of exposure to radiation doses (on wide projection objects), lack of distortion and overlapping imaging results and CBCT is highly filtered to evaluate hard tissue in the bones and jaw (Figure 5) (Nardi et al., 2017). The American Academy of Oral Maxillofacial Radiology (AAOMR) states that if oral cavity are found in an emergency where the patient is confirmed to be Covid-19 and requires radiography imaging, then CBCT can be used as an alternative (Cascante-Sequeira et al., 2020). The downside of CBCT is that CBCT imaging results have low contrast and difficulty in identifying soft tissues and the need for a deeper understanding of interpreting anatomy resulting from CBCT imaging (Alamri et al., 2012).

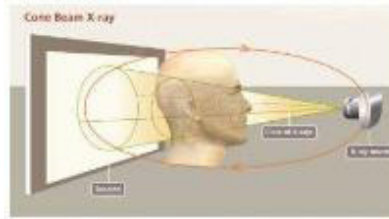


Figure 3. X-ray beam projections on CBCT where the opposite flat-panel source and detector rotate around the patient's jaw to capture image data in a single loop (Alamri et al., 2012).



Figure 4. The patient's position during CBCT radiography (Nardi et al., 2017).

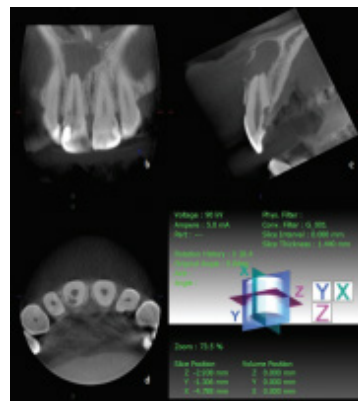


Figure 5. CBCT images from corona (b) sagittal (c) and axial (d) (Dawood et al., 2009).

Extraoral bitewing (EO BW)

The EO BW technique is a developmental form of panoramic engines using two horizontal parallel connections that rotate on the XY axis and move vertically on the Z axis (Figure 6). This technique uses Selective Compliance Assembly Robot Arm (SCARA) technology that developed by Professor Hiroshi Makino of Yamanashi University in 1979 (El-Ela et al., 2016). This technology used a fully programmable 3-axis robot to control the rotation and angles of the radiography beam aimed perpendicularly with the long axis of the patient's teeth. The radiography program generated bilateral EO BW radiography with 1 movement of the machine. Each EO BW radiography typically captured complete crowns and roots of canines to third molars of both arches (Chan et al., 2018).

The function of using the EO BW technique is to provide a clearer picture of the contact points of premolar and molar teeth in interproximal caries detection (6). Bitewing on a panoramic machine will produce an orthogonal picture by increasing the projection of interproximal angulation. Thus getting a better point of contact than the result of panoramic radiography (Little et al., 2020).

The EO BW technique has advantages including the resulting picture is a clearer picture than panoramic radiography especially in detecting interproximal caries of posterior teeth (Figure 7), radiation doses obtained less than panoramic radiography, can be used in patients with gag reflex complaints, pediatric patients who have difficulty opening the mouth, patients who have difficulty

opening the mouth (Akarslan et al., 2008). In addition, the use of EO BW is very suitable in the circumstances of the Covid-19 pandemic because of the lack of use of intraoral film that can reduce the risk of saliva transmission and oral droplets, but not all panoramic machines can perform EO BW techniques (E Silva et al., 2016).



Figure 6. The position of the skull and mandible during the process of taking radiography images using extraoral bitewing techniques (El-Ela et al., 2016).

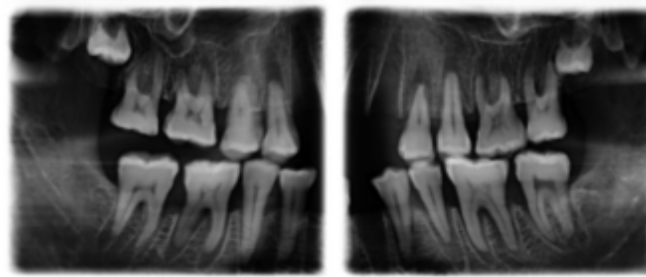


Figure 7. The image of extraoral bitewing (El-Ela et al., 2016)

Extraoral periapical

Extraoral periapical is a technique first developed by Newman and Friedman in 2003 as an alternative in patients who cannot use intraoral periapical techniques. Then this technique was developed by Later Chen et al in 2007 by aligning beam sensor beam (Kumar et al., 2011).

Taking radiography with extraoral periapical techniques by Newman and Friedman has several procedures that must be followed so that the results obtained are minimal errors. Taking in the upper jaw begins by placing the patient sitting upright, the mouth opened as wide as possible to avoid superimposition due to obstruction of x-ray rays from the opposite side, the sensor is placed on the outer surface of the bucal that directly leads to the opening tooth area, placing a cotton roll between the sensor and the bucal to align the x-ray cone is positioned tilted as 55° from horizontal (Figure 8). While, taking radiography in the lower jaw has a different thing than the upper jaw retrieval where the position of the patient's jaw closes but the chin is lifted to avoid superimposition and the x-ray cone is positioned tilted as much as 35° from horizontal (Figure 9) (Sabeti et al., 2012).

Extraoral periapical techniques have the advantage that they can be used in patients with gag reflex conditions, difficulty opening their mouths, pediatric patients, and disabled patients with growth and developmental disorders. This technique can minimize intraoral sensor sterilization so as to maintain radiography quality and maintain diagnostic information (Dewi & Sitam, 2020), in addition it can also minimize exposure to saliva secretions because there is no need to adapt the film to the patient's oral so as to reduce the risk of exposure of SARS-Cov-2. The disadvantage of this technique is the difficulty of setting the angle of angulation to get good results because each face shape has a different angulation angle due to the race and height of each individual's face. The image resolution obtained is low and cannot be used to get an image of the anterior tooth (Figure 10). This technique is also not suitable to be an evaluation picture in endodontic procedures due to the great

distance from x-ray ray sources and receptors (Kumar et al., 2011).



Figure 8. The position of extraoral radiography intake periapical upper jaw (Kumar et al., 2011).



Figure 9. The position of extraoral radiography intake periapical lower jaw (Kumar et al., 2011).

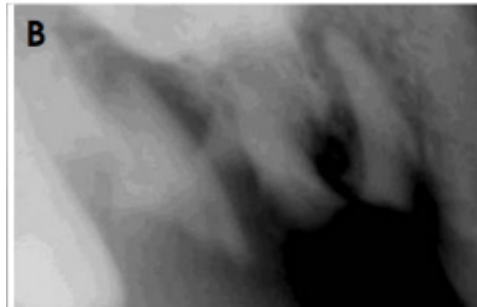


Figure 10. The image of extraoral radiography (Kumar et al., 2011).

DISCUSSION

The Covid-19 pandemic caused by the SARS-Cov-19 virus has changed the order of human life, not least dentistry activities. Dentistry activities can not be separated from exposure to aerosols scattered on airbornes and saliva droplets, while one of the transmissions of SARS-Cov-19 virus is from aerosols and saliva droplets. The dental activities that impacted during the Covid-19 pandemic are dental radiology that serves to assist dentists in the enforcement of diagnosis. Meanwhile, dental practitioners have a high risk of transmission of the SARS-Cov-19 virus (Little et al., 2020).

Dental radiography is divided into two types, including intraoral radiography and extraoral radiography. Intraoral radiography has a high potential in SARS-Cov-19 transmission due to the involvement of saliva droplets in the placement of film in the patient's oral cavity, while extraoral radiography has minimal risk because it does not require the placement of film in the patient's oral cavity. Several world dentistry organizations including Indonesia have suggested making extraoral radiography an alternative during the Covid-19 pandemic (Lubis & Rahman, 2020).

Extraoral radiography that can be used as an alternative during the Covid-19 pandemic include panoramic, Cone Beam Computed Tomography (CBCT), extraoral bitewing (EO BW) and extraoral periapical. Extraoral radiography consisting of panoramic, Cone Beam Computed Tomography (CBCT), extraoral bitewing (EO BW) and extraoral periapical. It is evident in the lack of exposure to saliva droplets during the retrieval process compared to intraoral radiography that requires placement of film in the patient's oral cavity. Extraoral radiography places a projection film outside the patient's oral cavity so it can minimize salivary droplet intakes between the dental practitioners and patients (Dave et al., 2020). Some extraoral radiography techniques are developed by previously existing techniques, including extraoral periapical radiography. Extraoral periapical radiography was developed by Newmann and Friedman who were initially as an alternative in patients with difficulty opening their mouths and having gag reflexes. The placement of the film in this technique is on the cheeks of patients with cotton rolls as a buffer to align the placement of x-ray sensor, so this technique can be used as an alternative during the Covid-19 pandemic. However, the drawback of this technique is that the difficulty in determining the angle of x-ray angulation and the resolution of the imaging is also low (Kumar et al., 2011). Panoramic and extraoral bitewing (EO BW) have the same principle in radiography techniques where the position of the patient's head is perpendicular and the film and x-ray beam projection will rotate. Extraoral bitewing is a modification of the system contained in the panoramic imaging machine. The results obtained specifically can interpret interproximal caries in the posterior tooth. Meanwhile, panoramic imaging interprets the whole from the curve of the upper jaw and lower jaw teeth. The disadvantage of both techniques is the existence of a superimposition image produced and not all panoramic machines that have the ability to use extraoral bitewing techniques (Akarslan et al., 2008). CBCT is an extraoral radiography which is the process of x-ray projection on CBCT is placed outside the patient's oral cavity, where the opposite flat panel source and detector rotate around the patient's jaw to capture image data in one round. So, this technique can be used as an alternative during the Covid-19 pandemic. This technique is able to provide 3D imaging that serves to see the details of hard tissue abnormalities in the jaw and bones. However, the results resulting from CBCT techniques have low contrast and need more knowledge and understanding to interpretation radiography results (Cascante-Sequeira et al., 2020).

In accordance with the direction of the world dental organization during the Covid-19 pandemic that all patients who come to dental health services have a risk of SARS-Cov-19 transmission. The use of dentistry radiography is only in emergencies and recommends using extraoral radiography as an alternative during the Covid-19 pandemic. However, the use of extraoral radiography cannot make it a substitute for intraoral radiography. There needs to be knowledge for dentistry practitioners about accuracy in selecting the type of radiography of each case and the availability of tools.

CONCLUSION

SARS-Cov-19 spreads directly, indirectly, or in close contact through the secretion of saliva and respiratory droplets released from those infected and become aerosol contamination. Air contamination caused by aerosols is mostly obtained from dentistry activities, one of them is intraoral radiography. Intraoral radiography has a higher risk of SARS-Cov-19 transmission due to saliva contamination than extraoral radiography. The placement film on extraoral radiography is outside the oral cavity and can minimize saliva contact when placing film between dental practitioners and patients. Therefore, the dental radiology activities were filtered using extraoral radiography during the Covid-19 pandemic. The extraoral radiography that can be an alternative to the lack of saliva contamination during the Covid-19 pandemic are panoramic, Cone Beam Computed Tomography (CBCT), extraoral bitewing (EO BW) and extraoral periapical. However, extraoral radiography can not replace the accuracy of intraoral radiography but some of these options are expected to be an alternative for dental practitioners especially in the selection of radiography types during the Covid-19 pandemic.

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Innovation of Kepok Banana Hump Bread (*Musa paradiciasa* L.) as Diabetes Diet Therapy: Literature Review

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ABSTRACT

Purpose: Diabetes has become a health problem that causes chronic complications such as heart disease, kidney failure and the risk of death which can reduce life expectancy and can increase mortality rates therefore intervention is required, especially in dietary intake. Management of low-carbohydrate and high-fiber diet is important for diabetics to prevent the occurrence of other complications. Kepok Banana Hump Bread could be alternative food choice for diabetes mellitus diet. This paper to review the Kepok Banana Hump Bread innovation as diet therapy for diabetics.

Methodology: This research using a literature review method pra experimental, true experimental, and literature review of research designs from 20 international and national journals. The literature search was carried out on the Google Scholar and Researchgate databases using three keywords, namely analysis of antidiabetic compounds on the Kepok Banana Hump; the potency of the Kepok Banana Hump; the impact of Kepok Banana hump powder on blood sugar levels.

Results: Kepok Banana Hump Bread that utilizes Kepok Banana Hump Flour in its production can be an alternative in diet management. Kepok Banana Hump Flour contains 25.5 glycemic index and 26,72% fiber. The addition of 40% banana hump flour can produce a distinctive flavor of banana hump flour with a strong taste, rough texture, slightly hard, and dark brown color. This Kepok Banana Hump Bread innovation is expected to be an alternative diet in the process of treating diabetes mellitus.

Application: Kepok Banana Hump, Glicemix Index Kepok Banana Hum, Kepok Banana Hump Bread, Diabetes Mellitus

BACKGROUND

Diabetes mellitus has become a health problem that has a fairly high prevalence in the world. Based on information from the International Diabetes Federation (2015), stated that in 2015, 415 million people suffered from diabetes mellitus worldwide. It is estimated that in 2040 there will be an increase to reach 642 million people suffering from diabetes mellitus with 193 million undiagnosed cases which cause the death of 5 million people. Indonesia is one of the countries with a high number of diabetics. Reporting from the International Diabetes Federation (IDF), it was confirmed that in 2017 Indonesia was ranked as the sixth highest diabetic after Chinese, India, the United States, Brazil, Mexico.

Diabetes is a metabolic disease with symptoms of hyperglycemia due to defects in insulin secretion, insulin action or both (Adi, 2018). Diabetes is also called the silent killer because it often occurs without the sufferer realizing it (Kemenkes, 2014). Risk factors for diabetes are individuals over the age of 30 years, obesity, heredity, and a lifestyle factor that tends to eat sweet and high sugar foods (Ramu, 2015). Diabetes mellitus can cause various complications such as heart disease, kidney failure, stroke and the risk of death which can reduce life expectancy, quality of life, and can increase health and mortality rates (Kemenkes, 2014). To suppress the occurrence of various intervention complications in people with diabetes mellitus, it is necessary to do something such as through discipline in applying the diet. The application of a diet for diabetics has the principle of high fiber and low glycemic index.

The Banana plant is a type of plant where the whole parts can be useful, such as fruit, flowers, leaves, including the stem part of the hump. The hump is the part of the plant that is submerged in the soil where the roots come out. Banana hump has a low glycemic index, high fiber and antioxidants which are good for diabetics. Banana hump (*Musa Paradiciasa* L.) is a part of the banana plant that

is easy to obtain, economical, but its use is often neglected. Banana hump contains 20% water, 76% starch, and 4% other ingredients (Sjofjan, 2021).

Compared to the Ambon banana hump and Raja banana hump, the Kepok banana hump has the lowest Glycemic Index content. Where the Ambon banana hump flour has a glycemic index value of 32.5; Raja banana hump flour of 45.6; and Kepok banana hump flour of 25.5 (Ridlo, 2021). Consumption of foods that contain a low glycemic index is very good for people with diabetes mellitus (Last, 2006). The glycemic index (GI) is one of the concepts important things to ask in choosing the right food suitable for Diabetes Mellitus patients. GI is a measure of speed a food increases blood glucose levels after consumed (Noviyanto, 2016). Low GI value is below 55, medium GI between 55 to 69, and GI high above 70 (Atayoğlu, 2016). Utilization of kepok banana hump can be done by processing it into a food, such as bread. Bread making using kepok banana hump flour has a high fiber content of 26.72% (Sjofjan, 2021). The recommended fiber intake of 25 grams per day prioritizes fiber in vegetables and fruit. In the large intestine, fiber can be fermented by colonic bacteria and can produce short chain fatty acids that may inhibit fatty acid mobilization and reduce gluconeogenesis. This will affect the insulin secretion, use of glucose, and glucose utilization by liver cells. This is reinforced by the previous research conducted by Chakraborty R et al (2021) in the manufacture of biscuits using kepok banana hump flour. This Kepok Banana Hump Flour can be used as an alternative material used in making bread. In addition, the characteristics of bread which is one of the most preferred foods and the process of making it is quite easy. Therefore, with the innovation of Kepok Banana Hump Bread it can be an alternative diet therapy that can be implemented for people with diabetes mellitus.

METHODS

Literature search strategy

The literature review was collected from 2 databases as follows Google scholar and Researchgate using 3 keywords, in the following: (1) The Analysis of Antidiabetic compounds in pseudo-stem of banana kepok; (2) A potential of pseudo-stem of banana kepok; (3) The effect of powdered pseudo-stem Banana Kepok on blood sugar levels. Inclusion criteria that were used in literature review searching are (Table 1): (1) The article was coherent with the main topic; (2) published last 7 years; (3) Open access and full text; (4) Reputable National and International article. Based on the search result, the total amount of literature review is 20 articles that embraces observational study. The searching flow of the literature can be observed in Table 1

Table 1. Literature Selection Criteria.

| Criteria | Inclusion | Exclusion |
|-----------------------------------|---|---|
| Population (P) | Pseudo-stem banana kepok | Other part of banana kepok |
| Intervention (I) | None | None |
| Comparators © | None | None |
| Outcomes (O) | Powdered pseudo-stem banana kepok is potential to decrease of blood sugar levels. | Powdered pseudo-stem banana kepok is potential to increase of blood sugar levels. |
| Study Design and Publication type | Pra experimental, true experimental, and literature review of research designs | Study Design and Publication type |
| Publication years | After 2015 | Before 2015 |
| Language | English and Indonesian | Other language than English and Indonesian. |

Study selection dan quality assessment

An explanation of study selection and quality assessment will be presented in the form of a diagram in Figure 1

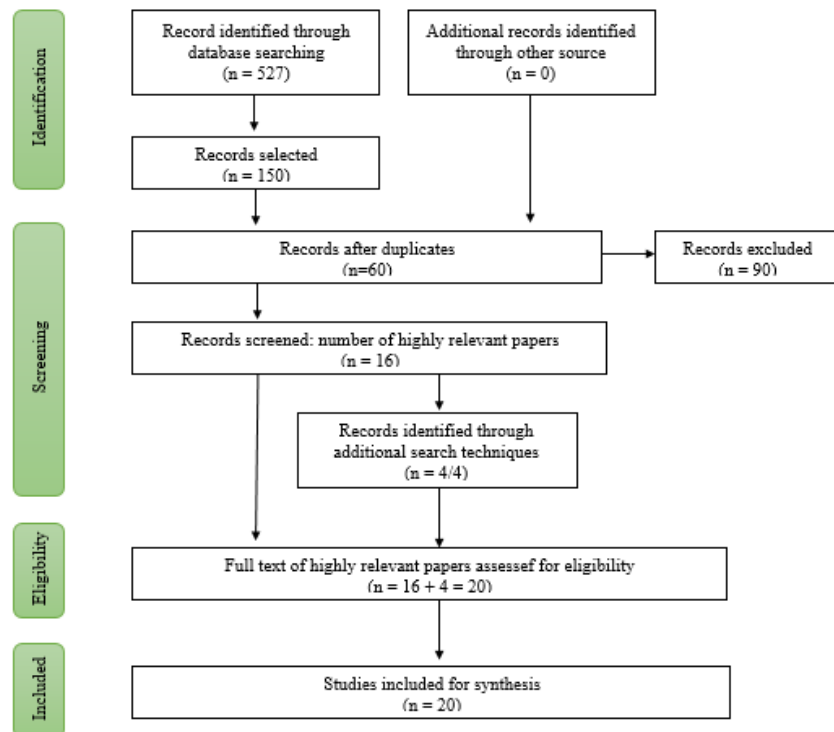


Figure 1. Study selection dan quality assessment.

RESULT AND DISCUSSION

Banana plants that have been harvested can not bear fruit again. This can increase the amount of organic waste, so it is necessary to use the remaining banana plant waste. One of the remaining waste in banana plants that can be utilized is the banana pseudostem. The banana pseudostem is the soft part of the banana stem and contains many components that are beneficial to health, one of the benefits possessed by banana pseudostem is the antidiabetic content which is proven to inhibit the performance of the α -glucosidase enzyme and contains a low total glycemic index (Aziz, 2011). Therefore, the Banana pseudostem is safe for a patient with diabetes and glucose intolerance.

From several studies, it was found that banana pseudostem is a high-fiber food ingredient, including kepok banana pseudostem. Banana pseudostem contains 20% water, 76% starch, and 4% other ingredients (Sjofjan, 2021). Other component that contained in the wet banana pseudostem plant is 43% calories; 0.36% protein; 11.6% carbohydrates; 15% calcium; 60% phosphorus; 0.5% iron; 0.01% vitamin B1; 12% vitamin C; and 86% water. Meanwhile, in the dried banana pseudostem contains 245% calories; 3.4% protein; 66.2% carbohydrates; 60% calcium; 150% phosphorus; 2% iron; 0.04% vitamin B1; 4% vitamin C; and 20% water (Sheng, 2010). Banana pseudostem also contains potassium and vitamin B6 which can help the process of insulin and hemoglobin production in the human body. Therefore, banana pseudostem can be used by processing it into food ingredients, one of which is flour. Banana pseudostem flour is made from fresh ingredients through a process of cutting, drying, and grinding (Sjofjan, 2021). Furthermore, banana pseudostem flour can be processed into bread products. This bread product can be one of the innovations in the food industry, especially for diet therapy in diabetics. Based on the results of the journals obtained are described in Table 2

Table 2. Innovation Banana Bread Hump as diabetes diet therapy.

| Summary | Structure | Important Found | Methods | Generalization | References |
|---|--|---|--|---|--------------------------------------|
| <p>Background: To know determine the application of banana hump flour rebinding in the deposition of meat and weight of hybrid duck feathers.</p> <p>Results: There was no significant effect ($P>0.05$) in the percentage of deposition of breast meat and feather weight. However, it had a significant effect on foot color ($P<0.01$).</p> <p>Conclusion: The application of 20% banana cob flour as a substitute for corn gave positive results in the aspect of hybrid meat and feathers</p> | <p>Title: The effect of replacing maize with re-binding banana hump flour on the meat quality, footpad color, and feather or hybrid duck</p> <p>Authors: O Sjoefan et al.</p> <p>Affiliation: University of Brawijaya</p> <p>Publisher: IOP Publishing</p> <p>Year: 2021</p> | <p>Making banana hump flour starts from the process of cutting, drying and milling. The fiber content in banana hump flour is the crude fiber content of 26.72% and the GE (Gross Energy) content of 2244.20 Kcal/kg.</p> | <p>Data collection method using Completely Randomized Design (CRD) consisting of 5 treatments and four replicate treatments.</p> | <p>Banana Hump Flour has a high crude fiber content</p> | <p>Total: 12 Year: 2015-2021</p> |
| <p>Background: Various parts of Pisang kepok (Musa paradisiaca) that can be used include weevil, but it is still rarely excavated.</p> <p>Results and Conclusions: The highest glucose yield was at a concentration of 0.8 N and at a 30 minute reaction it contained 6.25 grams of glucose / 20 grams of dry sample, and the conversion was 27.22% in 20 grams of dry sample.</p> | <p>Title: The Influence of Variation in Time and HCl Concentration to the Glucose Produced from Kepok Banana</p> <p>Authors: Rohman M, Denny and Faisal RM</p> <p>Affiliation: Islamic University of Indonesia, Yogyakarta, Indonesia</p> <p>Publisher: IOP Publishing</p> <p>Year: 2016</p> | <p>The hydrolysis of banana weeds was carried out using HCl as a catalyst. The amount of glucose produced is the result of a good catalyst concentration. 60% NaOH is used to neutralize the pH of the hydrolyzed filtrate</p> <p>The length of hydrolysis time also affects the level of glucose produced. The high level of glucose is obtained from the length of time the hydrolysis reaches the optimum point.</p> | <p>Experiments and Literature using laboratory test and literature from internet references, books, or related university references</p> | <p>The greater the concentration of the catalyst in identifying the kepok banana hump, the greater the glucose level produced</p> | <p>Total: 14 Year: 1958-2013</p> |
| <p>Background: Banana hump is part of the banana plant rarely used, but is rich in nutrients.</p> <p>Purpose: Introducing and training</p> | <p>Title: Pemberdayaan masyarakat di Desa Balai Makam dalam pemanfaatan bonggol pisang sebagai</p> | <p>The best banana hump flour from the kepok banana variety after being harvested has the characteristics of 1.02% water</p> | <p>Research Method: Descriptive</p> | <p>Banana hump is high in fiber, carbohydrates and calcium.</p> | <p>Total: 11 Year: 2013-2019</p> |

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|---|---|---|---|---|---|-------------------------------------|
| <p>the skills of making flour from banana hump which we named "Tebosang" to the people of Balai Makam Village, Bathin Solapan District, Bengkalis Regency.</p> <p><i>Results and Conclusions:</i> The level of understanding of the community in making banana hump flour is very good, even to the point that some are producing and selling it commercially</p> | <p>rintisan Usaha Mikro Kecil Menengah (UMKM)</p> <p>Authors: Tetty et al</p> <p>Affiliation: University of Riau</p> <p>Publisher: Unri Conference Series: Community Engagement</p> <p>Year: 2020</p> | <p>content, 0.8% ash content, 10.42% yield, 0.37% swellability, 254.3% water absorption, crude fiber 29.2%, resistant starch 39.35%, prebiotic Fructooligosaccharide (FOS) content of 427.03 mg/mL</p> <p>The best quality kepok banana hump flour to be used as flour with lower water content, high water absorption ability and high crude fiber and prebiotics can suppress glucose production</p> <p>The quality of the hump will decrease after three days of cutting down the banana tree, the bulb will change color due to the influence of the respiratory system on the tuber. This respiration causes a decrease in food reserves (in the form of starch, sugar, etc.) in the commodity, reduces the taste of the commodity (tastes bland) and promotes spoilage.</p> | <p>The water content obtained in banana cob flour is 0.69%, in contrast to the water content of wheat flour and tapioca flour by 12% and 9%.</p> <p>The result of the fiber content of banana hump flour is 20%</p> <p>The results of organoleptic physical quality on banana hump flour are in the form of powder, brownish white color,</p> | <p>Experimental with the process of making banana hump flour, organoleptic physical testing</p> | <p>The content of banana hump flour has a high fiber content and is brownish white in color</p> | <p>Total: 9 Year: 2004-2016</p> |
| <p><i>Background:</i> Dried banana hump can be used as flour and has a very high carbohydrate content, so it can be used as an alternative to wheat flour and rice.</p> <p><i>Results:</i> the physical and chemical characteristics of kepok banana hump flour, the water content of banana hump flour is 0.69% and the ash content is 10% and</p> | <p>Title: Karakteristik Fisiko Kimia Tepung Bonggol Pisang Kepok (Musa Paradisiaca F.)</p> <p>Authors: Lailizyach Fitria, Ayu Yusuf</p> <p>Affiliation: Akademi Analis Farmasi Dan Makanan Putra Indonesia Malang</p> <p>Publisher: Akafarma Putra Indonesia Malang</p> | | | | | |

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|---|--|---|---|--|------------------------------|
| the fiber content is 20% and the fat content is 3.74% and the protein content is 3.4% and the carbohydrate content is 65.47% and powder form, brownish white color, distinctive odor and tasteless. | Year: 2018 | tasteless and the consistency of flour after adding hot water expands to form like porridge. | | | |
| <p><i>Background:</i> Kepok banana peel contains saponins, tannins and flavonoids that can reduce total cholesterol levels.</p> <p><i>Result:</i> The reduction in total cholesterol levels can be effectively done with nutritional therapy with banana peels, where 8.4 mg/day is more effective than banana peel extract levels of 16.8 mg/day.</p> <p><i>Conclusion:</i> The anticholesterol effect of banana fiber ethanol extract was shown to reduce total cholesterol in obese male ddY mice (Mus musculus L.).</p> | <p>Title: The Effect of Giving Extract Etanol of Kepok Banana Peel (Musa Acuminata) toward total Cholesterol Level on Male Mice (Mus Musculus L.)</p> <p>Strain Deutschland-denken-yoken (ddy) Obese</p> <p>Authors: Khairun and M. Azzaky</p> <p>Affiliation: Universitas Lampung; Medical Faculty, Universitas Lampung</p> <p>Publisher: Biomedical & Pharmacology Journal</p> <p>Year: 2018</p> | <p>Decrease in serum triglyceride levels as much as 40.4% can be done using banana kepok (typical of Musa paradisiaca forma) with a dose of 9 grams/day</p> <p>The flavonoid content in bananas can inhibit the action of the 3-hydroxy 3-methylglutaryl coenzyme A reductase (HMG Co-A reductase) enzyme which can lower cholesterol in the blood.</p> | True experimental. | The anticholesterol effect of banana fiber ethanol extract has been shown to reduce total cholesterol and diabetes | Total: 26 Year: 1997-2017 |
| <p><i>Background:</i> This experimental study aims to determine (1) formula for choco cookies with kepok banana pseudostem flour (2) quality of choco cookies with kepok banana pseudostem powder from taste, flavor and texture.</p> <p><i>Result and Conclusions:</i> The quality of choco cookies the average score of 2.94 obtained with banana pseudostem flour from the aspect of taste, which is in the good category, which</p> | <p>Title: Pemanfaatan Tepung Bonggol Pisang Kepok (Musa Acuminata Balbisiana) Menjadi Choco Cookies</p> <p>Authors: Made Saputra, Risa, Damia</p> <p>Affiliation: Ganesha Singaraja University of Education, Indonesia</p> <p>Publisher: Jurnal Bosaparis: Pendidikan Kesejahteraan Keluarga</p> <p>Year: 2019</p> | <p>The addition of refined sugar as a sweetener as well as covering the bitter taste in the kepok banana pseudostem flour, and also serves to improve the texture when in the oven.</p> <p>To make the texture of the product smoother, the kepok banana pseudostem flour is trying to be sifted 2 times to make it smooth.</p> | Experimental method and observation method. | Kepok banana pseudostem flour produces the best quality compared to raja bananas, mahuli bananas, milk bananas and ambon bananas | Total: 16 Year: 1999-2018 |

means it has a sweet and savory taste. The average score of 2.89 is obtained from the flavor aspect, which is in the good category, which means it has a distinctive flavor of the kepok banana pseudostem. The average score of 2.78 is obtained from the texture aspect, which is in the good category which means it has a brittle texture.

Background: The raw material for nuggets and crackers can be made from banana hump, which is a local food commodity that is high in fiber
Purpose: To determine the fiber content of crackers nuggets with the basic ingredients of kepok banana hump (Musa paradisiaca Var. Balbisina Colla).

Result and Conclusions: The nugget formulation consisted of 3 comparisons, the ratio of banana hump: wheat flour (25%: 75%) (F1), (50%: 50%) (F2), and (75%: 25%) (F3). The cracker formulation consists of 3 comparisons, the ratios of banana hump: tapioca flour (25%: 75%) (F1), (50%: 50%) (F2), and (75%: 25%) (F3). Test the fiber content by the gravimetry method which is then described.

Results : The results in this study was analyzed of the fiber value of nuggets and crackers kepok banana hump every (100g). The

Title: The Analysis of Fiber Content of Nuggets and Crackers with the Basic Ingredients of Kepok Banana Hump (Musa paradisiaca Var. Balbisina Colla)
Authors: Rifatul Ridlo, Sugeng Maryanto, Riva Mustika
Affiliation: Ngudi Waluyo University
Publisher: Jurnal Gizi dan Kesehatan
Year: 2020

Banana hump are foods that have high fiber. Carbohydrates are fibers in the banana hump which consist of cellulose, hemicellulose, pectin, and lignin.

The high fiber content in foodstuffs is directly proportional to the high component of the banana hump

Experimental design

Total: 22
Year: 1992-2020

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| <p>highest fiber content of nuggets was F3: 0.514g, F2: 0.322g and F1: 0.186g. The highest fiber content of Kepok banana hump crackers is F3: 0.861g, F2: 0.747g and F1: 0.727g. The fiber value of the kepok banana hump crackers is higher than the kepok banana hump nugget.</p> | | | | | |
| <p><i>Background:</i> Banana pseudostem has been known to have potential as a traditional medicine ingredient.</p> <p><i>Purpose:</i> Determine the ability of banana pseudostem extract in reducing Blood Sugar Level.</p> <p><i>Result and Conclusions:</i> Kepok banana pseudostem extract can reduce blood sugar levels in alloxan-induced rats. The best concentration in decreasing blood sugar levels is 200mg/200g body weight of rats. The results of this study are intended to assist the development of antidiabetic medicine that are useful for the health sector in the community.</p> | <p>Title: Pengaruh Ekstrak Bonggol Pisang Kepok terhadap Kadar Gula Darah Tikus yang Diinduksi Alokasan</p> <p>Authors: Desy, Ika, Lisana</p> <p>Affiliation: National Institute of Science and Technology</p> <p>Publisher: Jurnal Ilmu Kefarmasian</p> <p>Year: 2020</p> | <p>Banana extract has hypoglycemic activity where the flavonoid content of bananas is absorbed in the blood so that it can increase blood glucose solubility. Blood glucose becomes easily excreted through urine and blood glucose levels decrease (hypoglycemic effect).</p> <p>Kepok banana pseudostem extract has a hypoglycemic effect due to the synergistic effect of bioactive compounds contained, including flavonoids, saponins, tannins and triterpenoids</p> | <p>Experimental</p> | <p>Kepok banana pseudostem extract can decrease blood sugar levels in rats. The best concentration is 200 mg/200 g BW rats. This was supported by the results of phytochemical screening which showed that the extract contained flavonoid content, saponins, tannins, triterpenoids</p> | <p>Total: 17 Year: 2013-2018</p> |
| <p><i>Background:</i> After the banana plant is harvested, it will produce waste in the form of pseudo-stem. Banana pseudo-stem is usually used to make handicrafts, ropes, cloth, paper, etc. To utilize this remaining waste, banana pseudo-stem can also be used in powder form to produce food that has</p> | <p>Title: Utilization of banana pseudo-stem in food applications</p> <p>Authors: Thorat and H.P. Bobade</p> <p>Affiliation: Maharashtra Institute of Technology, Aurangabad (M.S.) India</p> | <p>Pseudostem flour has high fiber</p> <p>Banana pseudostem has a low glycemic index and has a high content of dietary fiber and antioxidants which are good for diabetes</p> | <p>Literature review</p> | <p>Dried banana pseudostem can increase shelf life. Banana pseudostem flour can be included in various recipes and can provide health benefits</p> | <p>Total: 15 Year: 1998-2016</p> |

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| <p>added value. It is useful to help cure kidney stones, gall bladder and also to control obesity.</p> <p><i>Result and Conclusions:</i> The fortification results from banana pseudo stem powder serve as nutritional improvement, nutraceutical food and can also be useful as medicine.</p> | <p>Publisher: International Journal of Agricultural Engineering Year: 2018</p> | <p>Title: Substitusi Tepung Bonggol Pisang Kepok (<i>Musa Acuminata Balbisiana</i>) Terhadap Tepung Terigu Dalam Pembuatan Pukis Authors: Seltiana, Rafika, St. Hadijah Affiliation: Politeknik Bosowa Publisher: Hospitality and gastronomy research journal Year: 2020</p> <p><i>Background:</i> Banana pseudostem has the potential to be developed because it has a carbohydrate content percentage of 66.2%. One variant of the use of banana pseudostem is banana pseudostem into flour.</p> <p><i>Purpose:</i> This study aims to process kepok banana pseudostem flour (<i>Musa Acuminata Balbisiana</i>) as a substitute for wheat flour in making pukis cakes and to measure people's acceptance of flavor, taste, texture, color.</p> <p><i>Result and Conclusions:</i> The results of the research through the hedonic test were the pukis products in terms of aroma, taste, texture and color with the criteria of very liking, namely by treatment with the addition of 10% (TBP10) and 20% (TBP20) banana pseudostem flour with the criteria of liking.</p> |
| | <p>Banana Hump Flour 40, namely the addition of 40% banana pseudostem flour to the pukis cake dough produces a distinctive flavor of banana hump flour with a thick taste, rough texture, slightly hard, and dark brown color. This happens because the addition of large amounts of banana pseudostem flour will produce a darker color, the dough does not expand, and makes the dough not easy to form.</p> <p>Banana Hump Flour 10 and Banana Hump Flour 20 it produces pukis with flavor and taste similar to control (100% wheat flour dough), soft texture with slightly different color where Banana Hump Flour 10 produces brownish white color, Banana Hump Flour 20 produces milk chocolate color</p> <p>The more addition of banana pseudostem flour in making substitutions will affect the flavor, taste, texture and color of the cake.</p> | <p>The data analysis used in this study is descriptive statistics with purposive sampling technique as a sampling technique.</p> <p>The preferred treatment by the panelists was the addition of 10% and 20% banana pseudostem flour, while the treatment that was dislike by the panelists was the addition of 40% banana hump flour.</p> <p>Total: 12 Year: 2016-2019</p> |

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| <p>Background: Banana pseudostem has an efficient inhibitory potential in a certain dose</p> <p>Purpose: to explain the mechanism of the hypoglycemic effect on the banana pseudostem.</p> <p>Results and Conclusions: Banana pseudostem can significantly inhibit the enzyme α-glucosidase in mammalian digestion and starch α-glucosidase. Banana pseudostem can inhibit the hydrolysis of sucrose, maltase, and p-nitrophenyl α-D-glucopyranoside with mixed type inhibition. The in-vivo study found that there is significantly suppressed maltose/glucose induction of plasma glucose postprandial elevations and exerted the effect of antihyperglycemic on normal and alloxan induction in diabetic rats with the oral administration of a pseudostem (100-200 mg/kg) banana hump.</p> | <p>Title: Investigation of Antihyperglycaemic activity of banana (Musa sp. Var Nanjangud rasa bale) pseudostem in normal and diabetic rats</p> <p>Author: Ramith et al</p> <p>Publisher: Wiley Online Library</p> | <p>Inhibitory effect of PSB (Pseudostem Banana) on α-amylase is lower than acarbose (therapeutic drug) α-glucosidase is have higher inhibitory effect when compared to acarbose</p> <p>In normal rats it is known that PSB significantly reduces the postprandial glucose induced by maltose.</p> | <p>Experimental method</p> | <p>PSB showed remarkable inhibition of yeast α-glucosidase compared to the therapeutic drug, acarbose. However, the inhibitory effect of PSB on α-amylase tends to be low compared to acarbose.</p> <p>PSB response in suppressing the increase in plasma glucose levels is relatively higher after administration at a dose of 200 mg compared to giving a dose of 100 mg</p> <p>Oral intake of PSB can significantly reduce postprandial plasma glucose levels in diabetic rats, suggesting that PSB may have anti-diabetic effects.</p> | <p>Total: 41 Year: 1934-2013</p> |
| <p>Background: Bread using banana pseudostem flour is very good for Diabetes Mellitus sufferers.</p> <p>Results and conclusions: the composition of bread shows a health-promoting agent, this is thought to be on the efficacy of consumers, especially for those</p> | <p>Title: In Vitro starch digestibility of bread with banana (Musa acuminata X balbisiana ABB cv. Awak) pseudostem flour and hydrocolloids</p> <p>Author: Lee Hoon Ho et al</p> <p>Affiliation: Universitas Sultan Zainal Abidin</p> | <p>The lowest total sugar content is found in the bread samples with the addition of 10% Banana Hump Flour</p> <p>The lowest total starch content in bread samples with 10% Banana Hump Flour and the addition of Xantan Gum</p> | <p>Analytical method</p> | <p>All of the bread samples showed a low in vitro starch hydrolysis rate which could provide breads with a low glycemic response</p> <p>Banana Hump Flour which is formulated</p> | <p>Total: 49 Year: 1970-2015</p> |

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| who are required to have a high-fiber diet. | Publisher: Elsevier | Hydrolysis index and GI note that all samples of bread made in the laboratory showed a significant decrease when compared with commercial bread. | in bread and added with hydrocolloids can provide digestive health effects and can be exploited to be explored in commercial diet intakes for people who must consume low GI foods. | Total: 69 Year: 1951-2020 |
| <p><i>Background:</i> Biscuits with the addition of Kepok Banana Hump Flour contain high protein, low fat and low sugar. Therefore, they are beneficial for diet and health.</p> <p><i>Results and Conclusions:</i> the addition of banana pseudostem flour can reduce the physical quality of the final product. However, the addition of sodium carboxymethylcellulose can increase bread height, volume and density.</p> | <p>Title: Banana pseudostem substitution in wheat flour biscuits enriches the nutritional and antioxidative properties with considerable acceptability</p> <p>Author: Rakhi Chakraborty et al</p> <p>Publisher: SN research artikel.</p> | <p>In total sugar, the highest value was found in the 30% sample with the addition of Kepok Banana Hump Flour (KBHF) and the lowest in the 0% sample with the addition of Kepok Banana Hump Flour.</p> <p>In reducing sugar, the highest value was found in the sample of 0% addition of KBHF and the lowest was found in the sample of 20% addition of KBHF.</p> <p>For the sensory characteristics of biscuits, it is quite acceptable, especially in the 10% KBHF and 20% KBHF samples.</p> | <p>Biscuits added with KBHF contain several bioactive compounds such as phenolics, flavonoids, ascorbate, proline. It also exhibits promising free radical scavenging activity.</p> <p>Biscuits with the addition of KBHF are high in protein, low in fat and low in sugar, so that they are beneficial for diet and health.</p> <p>Biscuits with the addition of KBHF have low humidity and high ash content followed by high paste temperatures and low viscosity so that they will provide a relatively longer shelf life.</p> | |

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| <p>Background: Bread containing banana pseudostem has high total phenol and antioxidant activity compared to normal bread.</p> | <p>Title: Bread towards Functional Food: An Overview Author: Ibrahim, Salleh, and Maqsood-ul-Haque Affiliation: University Teknologi Mara Publisher: International Journal of Food Engineering</p> | <p>The addition of banana pseudostem flour can reduce the physical quality of the final product. However, the addition of sodium carboxymethylcellulose can increase bread height, volume and density.</p> | <p>Experimental</p> | <p>Natural antioxidants such as flavonoids, tocopherols and phenolic acids can inhibit lipid peroxidase in food and improve food quality.</p> | <p>Total: 38 Year: 1995-2013</p> |
| <p>Background: Banana plants will produce high residues after the fruit is harvested and the latest research shows a biotransformation method using banana pseudostem extract to be used as a functional juice that contain a high biomolecular value and health benefits. Results and Conclusions: In the pseudostem bioprocess, bananas are estimated to contain prebiotic glucooligosaccharides and D-allulose.</p> | <p>Title: Biotransformation of banana pseudostem extract into a functional juice containing value added biomolecules of potential health benefits Author: Manisha et al Affiliation: Center of Innovative and Applied Bioprocessing (CIAB), Department of Biotechnology (DBT) Publisher: Indian Journal of Experimental Biology</p> | <p>The pseudostem juice extraction yields about 0.15 L of juice per kg of fresh biomass. The filtration is estimated to contain about 27.03 g/L sugar (11.25 g/L sucrose, 6.04 g/L glucose and 9.73 g/L fructose). Meanwhile, banana pseudostem juice which was concentrated as a retention of 5 Da showed 50.14 g/L consisting of 20.45 g/L sucrose, 11.37 g/L glucose, and 18.31 g/L fructose.</p> | <p>Experiment method</p> | <p>The nutraceutical component contained in banana pseudostem juice makes it potential as a healthy food source.</p> | <p>Total: 45 Year: 1995-2017</p> |
| <p>Background: This paintings offers with impact of banana (candy plaitain or 'kepok' variety) hump flour substituted to wheat flour withinside the making of noodle, on bodily, chemical, and sensory traits of noodle Result: Results confirmed that the exceptional bodily and chemical traits became proven with the aid of using noodle crafted from ten:ninety of banana hump to</p> | <p>Title: Physical, Chemical, and Organoleptic Characteristics of Dry Noodles at Various Ratios of Kepok Banana Hump Flour Authors: Asnani dan Abdul Rahim Affiliation: Tadulako University Palu Penerbit: AGROINTEK Year: 2019</p> | <p>The lower the percentage of banana hump flour substitution, the panelists accept the taste of noodles. So the amount of substitution of banana hump flour as the basic ingredient for making noodles is 10% -20%.</p> | <p>Experimental</p> | <p>The composition of noodles most acceptable of panelists is 10% banana hump flour with 90% wheat flour, and the best addition of banana hump flour is 10% -20%.</p> | <p>Total: 19 Year: 1985 -2013</p> |

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| <p>wheat flour, with 4.59% water absorption, 0.57% cooking loss, 10.37% water content, 34.21% starch content.</p> <p><i>Conclusions:</i> end result of sensory evaluation counseled that the maximum appreciated noodle became that crafted from flour percentage of twenty: eighty with 'like' for colour, texture, taste, and average preference and 'like very much' for aroma</p> | | | | |
| <p><i>Background:</i> Banana is one of the earliest plants cultivated via way of means of guy and nevertheless stays because the staple meals crop for millions of human beings in tropical world. It isn't most effective a wealthy supply of without difficulty digestible carbohydrate however additionally offers critical nutrition B, C and numerous minerals along with potassium, calcium and magnesium and numerous medicinal properties.</p> <p><i>Result and Conclusions:</i> Every part of the banana plant has its benefits</p> | <p>Title: Medicinal benefits of Musa paradisiaca (Banana) Author: Rajesh N Affiliation: JSS College of Arts, Commerce and Science, B. N. Road, Mysuru, Karnataka, India Penerbit: International Journal of Biology Research Tahun: 2017</p> | <p>Even though it has a sweet taste, the glycemic index of bananas is low, so it doesn't really affect blood sugar. Bananas can help to low the blood glucose levels because of antihyperglycemic properties. Pseudostem contains fiber that can help weight loss.</p> | <p>Qualitative using literature review</p> | <p>Every part of the banana plant has benefits for humans.</p> <p>Total: 15 Year: 1984 - 2013</p> |
| <p><i>Background:</i> Banana is one of the most important and very useful plants in the world. Banana plantations in Indonesia produce organic waste (fruit peel, midrib and weevil) which can cause environmental pollution problems. Some parts of the</p> | <p>Judul: Review of Pharmacological Activity Reviews of Waste of Ambon Banana and Kepok Banana Penulis: Desy Wenas Afiliasi: National Institute of Science and Technology</p> | <p>Antidiabetic activity due to presence of flavonoids, phenolics, saponins and tannins, lupenone and sitosterol which show potential antihyperglycemic activity.</p> | <p>Qualitative using literature review</p> | <p>The waste of Ambon bananas and Kepok bananas has many properties, namely anti-ulcer, antibacterial, antifungal, antioxidant, wound</p> <p>Total: 34 Year: 1993 - 2016</p> |

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| banana plant have been known as traditional medicine in community. | Penerbit: Sainstech Farma Tahun: 2017 | healing, antidiabetic, antihyperglycemic and antidiuretic. | | | |
| <p><i>Result and Conclusions:</i> Banana hump is used to treat worms in the digestive tract, diabetes, hemorrhoids, burns and cuts. All stem midribs are used to treat digestive disorders such as diarrhea, dysentery, cholera, removal of kidney stones, urinary tract and antidote to snake venom.</p> | | | | | |
| <p><i>Background:</i> The stem juices from Musa × paradisiaca L. banana flowers cultivated of their authentic herbal habitat in Vietnam and people cultivated in a greenhouse within the Czech Republic have been investigated for the presence of phytochemicals with antidiabetic potency</p> <p><i>Result:</i> From 17 anti-diabetic components, there are 12 antidiabetic components in the banana hump juice sample</p> <p><i>Conclusions:</i> Kepok banana hump juice contains antidiabetic components</p> | <p>Title: Antidiabetic Compounds in Stem Juice from Banana</p> <p>Authors: Dong Nguyen et al</p> <p>Affiliation: University of Chemistry and Technology Prague</p> <p>Publisher: Czech J. Food Sci</p> <p>Year: 2017</p> | <p>From 17 anti-diabetic components, 9 components are in the banana hump juice from greenhouse and 11 components are from Vietnam's native habitat</p> <p>There are 12 antidiabetic components in the banana hump juice sample, namely lupenol, Ferulic acid, Vanillic acid, Trans-cinnamic acid, p-Hydroxybenzoic acid, p-Coumaric acid, Rutin, Catechin/epicatechin, Chlorogenic acid, Gallic acid, Caffeic acid, and Nicotiflorin.</p> | <p>Experimental design using HPLC (UHPLC) coupled with (HRMS/MS)</p> | <p>Samples of banana weevil juice from their natural habitat and greenhouse contain antidiabetic components.</p> | <p>Total: 32 Year: 1986 – 2017</p> |
| <p><i>Background:</i> Among agricultural residues from banana manufacturing are the banana flowers, which stand up upon the bractsaxis of the inflorescence</p> | <p>Title: A potential of banana flower and pseudo-stem as novel ingredients rich in phenolic compounds</p> <p>Authors: Sam Ramirez et al</p> | <p>The fatty acid content in banana hump is higher than banana flower.</p> <p>Phenolic content by HPLC-ESI method analysis in the</p> | <p>Quantitative research using detailed phenolic compounds profile was evaluated by</p> | <p>There are phenolics, both in banana flowers and banana weevil</p> | <p>Total: 51 Year: 1957 – 2020</p> |

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| and the complete pseudo-stem, that's left at the floor of the plantation. These by-merchandise were extensively utilized in conventional medicine <i>Result and Conclusions:</i> In conclusion, this take a look at affords initial new facts on proximate composition and, especially, phenolic compounds profile, in DBF and DBPS, two byproducts from the banana enterprise presently neglected | Affiliation: Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria Publisher: International Journal of Food Science and Technology Year: 2021 | extractable polyphenols (EPP) (in banana flower) that is 3,5-Dihydroxybenzoic acid Gentisic acid, Protocatechuic acid, Hydroxybenzoic acid, 4-Hydroxybenzaldehyde Benzoic acid, Caffeic acid, p-Coumaric acid, Ferulic acid, Quercetin 3,4'-O-diglucoside, and Quercetin 3-O-sophoroside. Phenolic compounds identified by HPLC-ESI-QTOF MS analysis in the hydrolizable polyphenols (HPP) (flower banana) that is Protocatechuic acid, Gallic acid 3-o-gallate, Ferulic acid, and Isoferulic acid. Phenolic compounds identified by HPLC-ESI-QTOF MS analysis in the hydrolizable polyphenols (HPP) (banana pseudo-stem) yaitu Protocatechuic acid, p-Coumaric acid, Ferulic acid, and p-Coumaric acid ethyl ester | HPLC-ES-QTOF MS technique |
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Component and Benefits of Kepok Banana Pseudostem Flour

Based on the study, it is known that banana pseudostem contains antidiabetic components, namely lupenol, ferulic acid, vanillic acid, trans-cinnamic acid, p-hydroxybenzoic acid, p-coumaric acid, rutin, catechin/epicatechin, chlorogenic acid, gallic acid, and caffeic acid (Sarma, 2014). Based on the results of previous research conducted by (Florent, 2015) and (NUSANTARA, 2018) it is known that the nutritional content per 100 grams of kepok banana hump flour is 79.16% carbohydrates, 0.99% water content, 2.15% fat, 3.58% protein, 1.83% ash content and 29.62% crude fiber while the nutritional content per 100 grams of low protein wheat flour is 77.3%, 12.0% water content, 1.3% fat, and 8.9% protein, while the content of ash and crude fiber was not found in low protein wheat flour. Therefore, from the results of the data above it is known that the kepok banana hump flour contains higher crude fiber when compared to low protein wheat flour. While the kepok banana pseudostem flour contains several macrominerals including 79.16% carbohydrates, 2.15% fat, 3.58% protein (Florent, 2015) and 29.62% crude fiber, 0.99% water content, and 1.83% ash content (NUSANTARA, 2018).

In addition to containing the macromineral substances, kepok banana pseudostem flour also contains micromineral substances, such as potassium, sodium, calcium, magnesium, and phosphorus. In another explanation, it is known that the use of kepok banana pseudostem flour in the making of biscuit products will increase the nutritional component of these products, namely high protein content, low fat and low sugar (Kartini, 2019) and high fiber (Lindström, 2006) therefore, it is beneficial for diet and health. The high fiber component of 29.62% and the low glycemic index of 25.5 in the kepok banana pseudostem flour can be used as an innovation in the selection of basic ingredients for making bread for diabetics. The glycemic index (GI) is one of the concepts important things to ask in choosing the right food suitable for DM patients. GI is a measure of speed a food increases blood glucose levels after consumed (Ingwersen, 2007). Low GI value is below 55, medium GI between 55 to 69, and GI high above 70 (Atayoglu, 2016).

Organoleptic of Kepok Banana Pseudostem Flour

The innovation of using kepok banana pseudostem flour in the making of processed products such as bread, can increase the shelf life of these products. This is reinforced by the research conducted by Chakraborty R. et al, (Chakraborty, 2021) in the making of biscuits using kepok banana pseudostem flour where the product shelf life can last longer because kepok banana pseudostem flour has a low viscosity value. As for other characteristics, kepok banana pseudostem flour has a tart and bitter taste due to the sap which contains saponins and tannins. The flavor produced by the kepok banana pseudostem flour is a typical kepok banana pseudostem flavor. The texture of the kepok banana pseudostem flour is rough so it requires a twice sifting process to produce banana pseudostem flour with a smooth texture (Slamet, 2019). The color of the kepok banana pseudostem flour is brownish white color (Saragih, 2019). Thus, to create the whole aspects of taste, flavor, texture, and color that are acceptable to consumers, it is necessary to be concerned about the composition of kepok banana pseudostem flour in bread making.

Previous study conducted by (Asnani, 2019), stated that the addition of 40% kepok banana pseudostem flour to the pukis dough will produce a distinctive flavor of kepok banana pseudostem flour with a strong taste, rough texture, a bit hard, and a dark brown color. This occurs because the addition of excessive kepok banana pseudostem flour will produce a darker color, the dough does not expand, and makes the dough difficult to form. Meanwhile, the addition of 10% and 20% of kepok banana pseudostem flour will produce pukis with an aroma and taste that resembles pukis dough using 100% wheat flour, with a soft texture. Pukis color at the addition of 10% produces a brownish white color and the addition of 20% produce milk chocolate color. Therefore, in making kepok banana pseudostem bread, the best dose is 10% or 20% flour to create an acceptable taste, flavor, texture, and color.

Dosage and Method of Making Kepok Banana Hump Bread

The process of making Kepok banana pseudostem Bread, it starts from making the pseudostem flour which includes selecting the fresh banana pseudostem, cleaning the pseudostem, cutting, soaking, drying the pseudostem slices and refining the dry pseudostem. As for the dosage in its production, it is explained as follows Table 3

Table 3. Dosage and Method of Making Kepok Banana Hump Bread.

| Ingredients | Recipe/Dosage |
|-------------------------------|---------------|
| Kepok banana pseudostem flour | 300 g |
| Butter | 45 g |
| Stevia sugar | 20 g |
| Instant yeast | 6 g |
| Warm water | 110 ml |
| Egg | 55 g |
| Milk powder | 25 g |
| Milk | 55 ml |
| Salt | 4 g |

The steps were taken after the process of making kepok banana pseudostem flour are by mixing flour, warm water, and sugar, then stirring until evenly distributed. Then mix with milk and eggs. Prepare kepok banana pseudostem flour, powdered milk and instant yeast, then mix all ingredients until smooth. After that, mix the ingredients above until half-smooth, then add butter and salt. Knead the dough again until it is smooth and elastic. Grease the container with oil, then add the dough to the container and let sit for 15 minutes or until the dough have doubled size. Roll out the dough with a rolling pin until the bubbles are evenly distributed. Then, roll the dough and put it in a baking dish that has been smeared with margarine. Wait for the dough to expand almost to the surface of the pan, then put it in the oven at 170-180°C for 25-30 minutes or until the dough is evenly cooked.

From the overall discussion, it is known that both in terms of nutritional content and the components of the ingredients used in making kepok banana hump bread indicate that this banana hump bread can support the implementation of a diet in diabetics. This is because the kepok banana hump bread contains a high fiber content of 29.62% and a low glycemic index of 25.5. According to Nadimin (2009), states that if patients with diabetes mellitus perform a high fiber diet regularly and under control, it will reduce HbA1C levels by 2.7% and reduce the average blood sugar level as much as 82 mg/dL. According to Franz (2012), consumption of foods high in fiber and low in glycemic index can improve insulin sensitivity, reduce the rate of glucose absorption, and is beneficial in controlling blood glucose so as to reduce the risk of complications in diabetes mellitus sufferers.

CONCLUSION

Diabetes has become a health problem that causes chronic complications such as heart disease, kidney failure, stroke and the risk of death that can reduce life expectancy, quality of life, and can increase health and mortality rates, so interventions are needed, especially in food intake. Discipline in the process of treating Diabetes Mellitus is very important to note, such as in terms of food consumption. The recommended food intake for diabetics is low on the glycemic index and high in fiber. Diabetics are advised to eat foods that contain a low glycemic index. The Innovation of Kepok Banana Hump Bread can be used as an alternative for diabetics in controlling and lowering blood sugar levels (below 55). The Kepok Banana Hump Bread contains 25.5 glycemic index and 29.62% crude fiber. The low glycemic index and high crude fiber make banana kepok buns highly recommended

for diabetics. Kepok Banana Hump Bread contains flavonoids, saponins, tannins, triterpenoids, lupenol, ferulic acid, vanillic acid, trans-cinnamic acid, p-hydroxybenzoic acid, p-coumaric acid, rutin, catechin/epicatechin, chlorogenic acid, gallic acid, and caffeic acid. In creating aspects of taste, aroma, texture, and color that are acceptable to consumers, 10% or 20% of the composition of banana kepok hump flour can be added.

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Comparison of Sensitivity and Resistance to Ceftriaxone with Chloramphenicol in the Treatment of *Salmonella typhi* Infection : Literature Review

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ABSTRACT

Purpose: To compare the sensitivity and resistance between ceftriaxone and chloramphenicol in the treatment of *Salmonella typhi* infection. **Methodology:** The study used a literature review method and research samples were obtained from search results using e-databases in the form of PubMed, Google Scholar, and Science Direct. **Results:** From the search results found 1034 articles then the researchers screened according to the inclusion and exclusion criteria, obtained 15 articles were received for review. From all studies, it was found that *Salmonella typhi* was more sensitive to ceftriaxone than chloramphenicol. **Applications/Originality/Value:** *Salmonella typhi* is more sensitive to ceftriaxone and more resistant to chloramphenicol.

INTRODUCTION

Typhoid fever is a systemic infectious disease and one of the most common foodborne disease found in all countries. This disease is classified as an endemic disease in Indonesia that is obtained throughout the year (Suwandi & Sandika, 2017). *Salmonella typhi* only attack humans, not other hosts. While in other bacteria use animals and plants as hosts. Therefore, *Salmonella typhi* more often causes disease in humans, especially typhoid fever. This disease is an interesting case to discuss because until now this case has a high prevalence rate (Prehamukti, 2018). In addition to cases that are still high, there is resistance in the treatment of typhoid fever in various regions. Research in Mexico in 1973 found *Salmonella typhi* resistant to ampicillin. In subsequent developments, several countries reported the existence of strains of *Salmonella typhi* that were resistant to two or more classes of antibiotics commonly used, namely ampicillin, chloramphenicol, and cotrimoxazole (Juwita *et al.*, 2012). Research conducted by Indang *et al.*, (2013) in Palu City showed that *Salmonella typhi* bacteria were resistant to 4 types of antibiotics, namely ampicillin, amoxicillin, cephalexin, and chloramphenicol (Rahman, 2019). Typhoid fever can be treated with antibiotics. The use of antibiotics must be used correctly, according to the indications of the disease, according to the dose, according to the way of administration and still pay attention to the side effect. So it is hoped that the community will be rational and not excessive in using antibiotics in accordance with WHO (World Health Organization). However, over time unprocedural and uncontrolled use of antibiotics can lead to resistance, thereby increasing mortality and morbidity (Rahman, 2019). Previous research at the PKU Hospital Inpatient Installation Muhammadiyah Surakarta in 2009 showed that the most effective antibiotics frequently used from 95 patients with typhoid fever was cefotaxime 49.47%. The use of antibiotics that are in accordance with standard therapy in terms of accuracy the indications are 100%, the right patient is 98.95%, the right drug is 96.84%, and the right dose as much as 82.10% (Safitri, 2009). Other Research in Inpatient Installation Pambalah Batung Hospital, North Hulu Sungai Regency, South Kalimantan in 2009, the most widely used antibiotics are ceftriaxone 95% and cefotaxime 8% of 109 prescriptions. Conformity with standard therapy in terms of precise indications as much as 100%, right drug 97.25%, right patient 88% and right dose 9.17% (Marhamah, 2009). Researchers choose the antibiotics ceftriaxone and chloramphenicol in this literature review because in previous studies it was found that the two drugs were the most sensitive than other types of antibiotics. However, there are differences in the level of sensitivity and resistance between the two drugs in different countries. There are studies which state that *Salmonella typhi* is more sensitive to ceftriaxone, and there are also studies which state that *Salmonella typhi* is more sensitive to chloramphenicol. The researcher has the aim to analyse several previous studies to find out which antibiotics between chloramphenicol and ceftriaxone are more effective for treating typhoid fever, so that the problem of *Salmonella typhi* infection cases can be reduced by using the right antibiotics.

METHODS

The sample of this study was obtained from the search engine on the Mozilla firefox application using several databases such as Google Scholar, Pubmed, and Science Direct.

The keywords used were sensitive AND resistant AND (ceftriaxone OR cefaxona) AND (chloramphenicol OR amphenicol) AND “salmonella typhi”. The journal technique used follows the flow chart from PRISMA. Research journals are collected and a journal summary is made including the name of researcher, year of publication of the journal, country of research, title of research, method and summary of results or findings. The summary of the research journal is entered into a table, then similarities and difference are searched and then discussed to draw conclusions.

RESULT AND DISCUSSION

It found 42 journals from Pubmed, 42 journals from Science Direct, and 950 journals from Google Scholar, for a total of 1034 journals. Of the total journals identified there are 26 duplication journals, then the remaining 1008 journals for title screening. 90 journals with appropriate titles were obtained, then abstract screening was carried out. 34 journals with appropriate abstract were obtained, then full text screening was carried out, so that 15 journals were obtained for review.

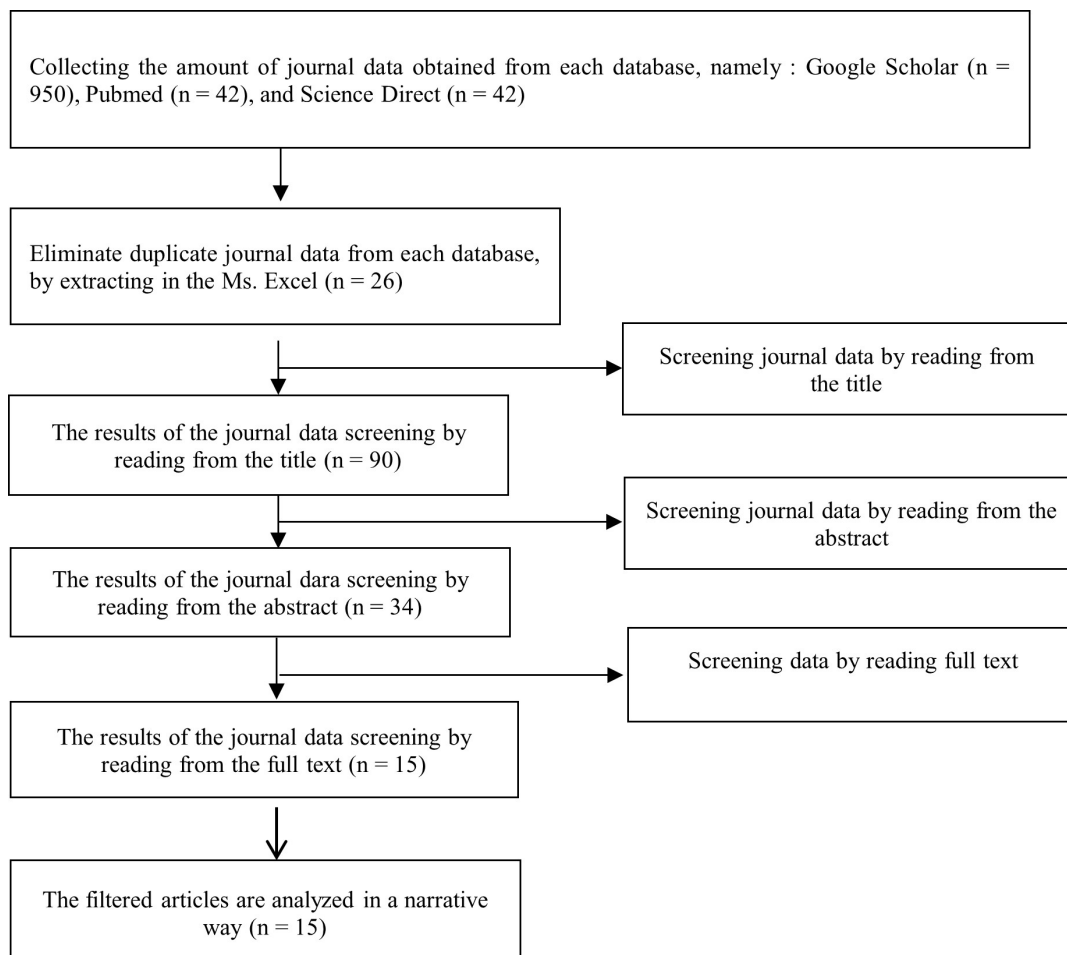


Figure 1. Flow Chart PRISMA

Table 1. General Characteristic of the Article

| Research (Year) | Title | Research Sites | Research Methods | Inclusion Criteria | Result |
|-------------------------|---|----------------------------------|------------------------|--|--|
| (Adabara et al., 2012) | The Prevalence and Antibiotic Susceptibility Pattern of <i>Salmonella typhi</i> among Patients Attending a Military Hospital in Minna, Nigeria | Minna, Nigeria | <i>Cross Sectional</i> | <ol style="list-style-type: none"> There are 100 patients diagnosed with typhoid fever 1-50 years old All Cantontment residents consisting of military personnel and civilians with the same source of drinking water | A total of 60 samples were positive for the growth of <i>Salmonella typhi</i> bacteria. The diameter of inhibition zone for chloramphenicol was 17,3 mm, which indicated that the bacteria were sensitive to chloramphenicol. While the diameter of inhibition zone on ceftriaxone is 5,4 mm, which means the bacteria are resistant to ceftriaxone. |
| (Admassu et al., 2019) | Prevalence and antimicrobial susceptibility pattern of <i>Salmonella enterica</i> serovar Typhi and <i>Salmonella enterica</i> serovar Paratyphi among febrile patients at Karamara Hospital, Jigjiga, eastern Ethiopia | Karamara, East Ethiopia Hospital | <i>Cross Sectional</i> | <ol style="list-style-type: none"> Patients with fever > 39 °C The patient has received therapy for at least 2 weeks | Total samples of <i>Salmonella typhi</i> were 14. Nine of them were sensitive to ceftriaxone by 64,3%, while <i>Salmonella typhi</i> was sensitive to chloramphenicol by 0%. |
| (Ahmad et al., 2021) | Pattern of Antibiotic Resistance in <i>Salmonella typhi</i> Isolates With Special Consideration to Extended Drug Resistant Typhoid | Saidu Hospital | <i>Cross Sectional</i> | <ol style="list-style-type: none"> Patients who have a high fever for more than 5 days with symptoms such as vomiting, anorexia, diarrhea, abdominal pain, dizziness, hepatomegaly, splenomegaly | <i>Salmonella typhi</i> has high resistance to third generation cephalosporin antibiotics and azitromycin. The sensitivity level of <i>S. typhi</i> to ceftriaxone was 8,14% with a resistance of 91,86%. Meanwhile, chloramphenicol has a sensitivity of 16,28% with a resistance of 83,72%. |
| (Ali Shah et al., 2020) | Antimicrobial Sensitivity Pattern of <i>Salmonella Typhi</i> : Emergence of Resistant Strains | Pakistan | <i>Cross Sectional</i> | <ol style="list-style-type: none"> 81 patients with positive culture results for <i>Salmonella typhi</i> 12-91 years old | The sensitivity and resistance level of <i>Salmonella typhi</i> to ceftriaxone was 49,4%, while the sensitivity to chloramphenicol was 26%, with resistance 74%. |

| | | | | | |
|--|---|------------------------------|--------------------|---|---|
| (Awol et al., 2021) | Prevalence of <i>Salmonella</i> enterica serovar Typhi infection, its associated factors and antimicrobial susceptibility patterns among febrile patients at Adare general hospital, Hawassa, southern Ethiopia | South Ethiopia | Cross Sectional | <ol style="list-style-type: none"> 1. Fever 37°C 2. Patients over 15 years old 3. Typhoid fever has been diagnosed by Widal test 4. Willing to be a research respondent | The total respondents who were diagnosed with typhoid fever were 422 people. After treatment, <i>Salmonella typhi</i> had 100% sensitivity to ceftriaxone, while sensitivity to chloramphenicol was 80% with 20% resistance. |
| (Choudhary et al., 2013)(Choudhary et al., 2013) | Antimicrobial susceptibility of <i>Salmonella enterica</i> serovars in a tertiary care hospital in Southern India | Apollo, South India Hospital | Studi Kohort | <i>Salmonella typhi</i> isolates from blood cultures from South India | 322 <i>Salmonella typhi</i> isolates were used. It was found that the sensitivity level of <i>Salmonella typhi</i> bacteria to ceftriaxone and chloramphenicol was both 100%. |
| (Hammad et al., 2011) | Ceftriaxone versus Chloramphenicol for Treatment of Acute Typhoid Fever | Cairo, Egypt | Prospective Study | Patients diagnosed with typhoid fever are characterized by positive culture for <i>Salmonella typhi</i> and are willing to be respondents | There was no <i>Salmonella typhi</i> resistance to ceftriaxone, while 8% of <i>Salmonella typhi</i> isolates were resistant to chloramphenicol. |
| (Makkar et al., 2018) | Epidemiological Profile and Antimicrobial Resistance Pattern of Enteric Fever in a Tertiary Care Hospital of North India - a Seven Year Ambispective Study | North India | Ambispective Study | The sample in this study used patients aged 5-46 years who were diagnosed with typhoid fever after isolation of <i>Salmonella typhi</i> bacteria by blood culture | A total of 623 isolates of <i>Salmonella typhi</i> were used in this study. These bacteria have a sensitivity level of 96,14% to ceftriaxone. While the sensitivity to chloramphenicol is 86,19%. |
| (MEMON et al., 2020) | Frequency and Antimicrobial Resistance Pattern of Extensive-Drug Resistance <i>Salmonella typhi</i> Isolates | Kharadar, Pakistan Hospital | Cross Sectional | Patients from the cities of Layari and Saddar who were diagnosed with typhoid fever after blood culture | A total of 969 cases of typhoid fever were identified by isolation of <i>Salmonella typhi</i> from blood cultures. It was found that 27,7% of <i>Salmonella typhi</i> isolates were sensitive to ceftriaxone, while the sensitivity to chloramphenicol was 17,4%. |

| | | | | | |
|------------------------------------|---|---|--------------------------|--|--|
| (Mohammad Ali Rashed et al., 2021) | Sensitivity Patterns of Isolated Salmonella Typhi in Children with Typhoid Fever | Dhaka, Bangladesh | Cross Sectional | <p>1. Patients diagnosed with typhoid fever and admitted to Dhaka Hospital during the study</p> <p>2. Patients aged children with male and female sex.</p> | <p>Patients used in this study were 100 children aged 1-10 years. The results showed that <i>Salmonella typhi</i> had a high sensitivity of 100% to ceftriaxone, while it had a sensitivity of 75% to chloramphenicol.</p> |
| (Niroula et al., 2020) | Antibiotic Susceptibility Pattern of Salmonella Enterica serovars Typhi and Paratyphi A Isolated From Patients Suspected of Enteric Fever | Kathmandu, Nepal | Cross Sectional | <p>This study used a sample of patients aged 10-70 years who were treated at Bir Hospital, Nepal. Each patient took about 5-10 ml of blood for blood culture. Samples were incubated at 37 C for 48 hours.</p> | <p>There were 27 <i>Salmonella typhi</i> isolates used, of which 90% of <i>Salmonella typhi</i> isolates were sensitive to chloramphenicol. While treatment using ceftriaxone cases of resistance occur sporadically.</p> |
| (Patil & Mule, 2019) | Sensitivity pattern of salmonella typhi and paratyphi a isolates to chloramphenicol and other anti-typhoid drugs: An in vitro study | Mumbai, India | Prospective Study | <p>Patients with positive culture results for <i>Salmonella typhi</i> originating from North, South, Est, and West India</p> | <p><i>Salmonella typhi</i> had 100% sensitivity to ceftriaxone, while 94,4% of these bacteria were sensitive to chloramphenicol.</p> |
| (Sattar et al., 2020) | Current trends in antimicrobial susceptibility pattern of <i>Salmonella typhi</i> and <i>paratyphi</i> | Pakistan | Observational Laboratory | <p><i>Salmonella typhi</i> and <i>Salmonella paratyphi</i> bacteria isolated from blood cultures.</p> | <p>The sample of <i>Salmonella typhi</i> used was 44. The percentage level of sensitivity of these bacteria to chloramphenicol was 68%, while to ceftriaxone was 79,5%.</p> |
| (Tarana et al., 2019) | Antimicrobial susceptibility pattern for Salmonella Typhi isolated from blood in Shaheed Suhrawardy Medical College, Dhaka | Microbiology Laboratory of Faculty of Medicine Shaheed Suhrawardy | Retrospective Study | <p>1. Patients aged 15-30 years</p> <p>2. Frequent outdoor activities</p> <p>3. Blood culture was found positive for <i>S. typhi</i></p> | <p>The isolates of <i>Salmonella typhi</i> used were 30. The bacteria were sensitive to ceftriaxone by 66,66%, while the sensitivity level to chloramphenicol was 40%.</p> |
| (Umair & Siddiqui, 2020) | Antibiotic Susceptibility Patterns of Salmonella Typhi and Salmonella Paratyphi in a Tertiary Care Hospital in Islamabad | Islamabad, Pakistan | Cross Sectional | <p>Patients aged 12 years and over with positive culture results for <i>Salmonella typhi</i> in 2012-2018.</p> | <p>A total of 158 <i>Salmonella typhi</i> isolates were found to have <i>S. typhi</i> bacteria that were resistant to ceftriaxone by 4,4% and resistance to chloramphenicol by 46,9%.</p> |

The results of the journal analysis obtained 15 journals that met the inclusion criteria. All of these journals discuss the susceptibility of *Salmonella typhi* to various antimicrobials in several countries. *Salmonella typhi* is a gram-negative rod-shaped bacterium that does not form spores, and has a capsule. These bacteria measure 1-3.5 μ m x 0.5-0.8 μ m. *Salmonella typhi* has a cell wall consisting of murein, lipoprotein, phospholipid, protein, and lipopolysaccharide (LPS) and is arranged in layers. The length varies, and most have peritrichous flagella so that they are motile. *Salmonella typhi* forms acid and gas from glucose and mannose. This organism also produces H₂S gas but only a little. Ceftriaxone is a third-generation cephalosporin beta-lactam antibiotic with a broad spectrum of action and includes many gram-positive and gram-negative bacteria (Hammad *et al.*, 2011). This antibiotic works by inhibiting the synthesis of mucopeptides required for the formation of bacterial cell walls, namely by inhibiting the third stage of the transpeptidase reaction in a series of cell wall formation reactions (Katzung *et al.*, 2012). Ceftriaxone has high stability against beta-lactamases, both against penicillins and cephalosporins produced by gram-negative and gram-positive bacteria. Ceftriaxone works by interacting with the bacterial cell wall. This impairs the permeability of the bacterial cell wall and promotes the diffusion of antibacterial compounds within the bacterial cells. When diffusion occurs, the bacterial growth process is interrupted, resulting in inhibition of bacterial growth (bacteriostatic). In addition, antibacterial compounds can penetrate cell membranes and interact with bacterial genetics to mutate bacteria. This creates a suppression zone on the disk using the Kirby-Bauer diffusion process. The mechanism by which *Salmonella typhi* is resistant to ceftriaxone is to degrade beta-lactams from ceftriaxone to produce beta-lactamase enzymes that can eliminate their antibacterial effects. Chloramphenicol is a broad-spectrum antibiotic that is bacteriostatic and active against both aerobic and anaerobic Gram-positive and Gram-negative bacteria (Ali Shah *et al.*, 2020). This medicine is soluble in alcohol, but not in water.

Chloramphenicol succinate used for parenteral administration is easily soluble in water. The drug is hydrolyzed *in vivo* by the release of chloramphenicol. Chloramphenicol works by inhibiting the enzyme peptidyltransferase. Peptidyl transferase acts as a catalyst for the formation of peptide bonds in the bacterial protein synthesis process. Chloramphenicol is also bacteriostatic or suppresses bacterial growth. Therefore, the suppression zone is perceived as a clear area around the area containing the antibacterial substance. The diameter of the zone that inhibits bacterial growth indicates the susceptibility of the bacterium to antibacterial substances. In addition, the suppression zones formed by bacteria should be more sensitive with larger diameters. *Salmonella* resistance of typhoid fever to chloramphenicol is the target of antibiotics / ribosomes, the production of inactivating agents in the form of the enzyme chloramphenicol acetyltransferase, and antibiotics from the outer membrane and antibiotics from the cytoplasm. It can be caused by a mechanism that limits the continued intrusion of. Low levels of resistance to chloramphenicol arise from a large population of chloramphenicol-sensitive bacteria by selecting mutants with low permeability of this drug. Top of Form (Katzung *et al.*, 2012).

In a study conducted by Choudary *et al.* (2013) the results showed that ceftriaxone and chloramphenicol had the same 100% sensitivity, but in other studies, different results were found. Research that states ceftriaxone is more sensitive than chloramphenicol was carried out by Sattar *et al.*, (2020), Awol *et al.*, (2021) especially in developing countries like Ethiopia. But there is a little information about prevalence and factors association with *S. typhi* and its antimicrobial susceptibility pattern in Ethiopia especially in the study area. The aim of this study was to determine the prevalence of *S. typhi* infection, its associated factors and antimicrobial susceptibility pattern among patient with a febrile illness at Adare General Hospital, Hawassa, Southern Ethiopia. Methods: Hospital based cross sectional study was conducted among 422 febrile patients from May 23, 2018 to October 20, 2018. A 5 ml venous blood was collected from each febrile patient. Culture and biochemical test were performed for each isolate. Antimicrobial susceptibility testing was performed for each isolate using modified Kirby-Bauer disk diffusion techniques. Result: In this study, the prevalence of *S. typhi* among febrile illness patients at Adare General Hospital was 1.6% [95% confidence interval (CI), Ali Shah *et*

al., (2020), Makkar et al., (2018), Tarana et al., (2019), Admassu et al., (2019), MEMON et al., (2020), Umair & Siddiqui, (2020), Hammad et al., (2011), Patil & Mule, (2019), Mohammad Ali Rashed et al., (2021) with an average sensitivity level of 49-100%. According by Sattar et al, (2020) which found that the sensitivity level to ceftriaxone was 79.5%. Meanwhile, the sensitivity level of *Salmonella typhi* to chloramphenicol is 68%. In addition, researchers Awol et al, (2021) also found that the highest level of sensitivity was to ceftriaxone, which was 100%, while the sensitivity to chloramphenicol was 80%. Similar results were also obtained by researcher Ali Shah et al, (2020), where ceftriaxone had a greater sensitivity of 49.4%, while chloramphenicol had a sensitivity of 26%. Researcher Makkar et al, (2018) also stated that ceftriaxone has a higher sensitivity of 96.14% compared to chloramphenicol with a sensitivity level of 86.19% (Makkar et al., 2018).

There is also a study on antimicrobial susceptibility conducted by Tarana et al, 2019 where the results are that *Salmonella typhi* is more sensitive to ceftriaxone by 66.66%, while sensitivity to chloramphenicol is 40% (Tarana et al., 2019). In line with research conducted by Admassu et al, 2019 which stated the sensitivity level of *Salmonella typhi* to ceftriaxone was 64.3%, while that to chloramphenicol was 0% (Admassu et al., 2019). Researchers Patil and Mule, 2019 conducted a study on antimicrobial sensitivity in four zones in India, namely East, West, South, and North India. The results obtained in the four zones are that the sensitivity level to ceftriaxone is 100%. Meanwhile, the sensitivity to chloramphenicol is in the range of 89-95%. In a study conducted by Umair et al, (2020) recommended third generation cephalosporins to be used as empirical therapy and for the treatment of MDR cases of enteric fever. The results of a study conducted by Umair *et al*, (2020) showed a higher level of sensitivity to ceftriaxone than chloramphenicol (Umair & Siddiqui, 2020). In a study conducted by Hammad *et al*, (2011) it was found that there was no resistance to ceftriaxone, while resistance to chloramphenicol was 8% (Hammad *et al.*, 2011). The study conducted by Memon et al, 2020 used a sample of 969 people diagnosed with typhoid fever. A total of 777 of them were resistant to first-line antibiotics such as ampicillin, chloramphenicol, and cotrimoxazole. A total of 517 people were resistant to second-line antibiotics, namely ciprofloxacin and ceftriaxone. In this study, it was concluded that ceftriaxone had a higher sensitivity than chloramphenicol (MEMON *et al.*, 2020).

Another study which stated that chloramphenicol was more sensitive than ceftriaxone was conducted by (Adabara et al., 2012), (Ahmad et al., 2021), and (Niroula et al., 2020) with an average sensitivity level of 16-96%. Research conducted by Adabara et al, (2012) used the measurement of the inhibition zone to determine the sensitivity of *Salmonella* to antimicrobials. The results showed that chloramphenicol had the largest inhibition zone diameter of 17,3 mm, while the diameter of the inhibition zone in ceftriaxone was 5,4 mm (Adabara et al., 2012). Researcher Mohammad Ali Rashed *et al*, (2021) conducted a study on the sensitivity pattern of *Salmonella typhi* in children with typhoid fever. The samples used were pediatric patients who had been diagnosed with typhoid fever and treated at the hospital. The results showed that ceftriaxone had the highest sensitivity of 100%, while the sensitivity of chloramphenicol was 75%. The risk factor for typhoid fever is dominated by boys because boys are more independent and have more opportunities to be exposed to street food. Many studies show a higher prevalence in low socioeconomic status. In addition, other factors are the lack of availability of clean water, and exposure to contaminated food is increasingly rampant (Mohammad Ali Rashed et al., 2021). Typhoid fever therapy can use antibiotics, with rational use and not excessive. Research conducted by Niroula et al, (2020) stated that antibiotics such as amoxicillin, cotrimoxazole, and chloramphenicol have been used previously as first line drugs to fight *Salmonella* infections. However, recently there is resistance to first line drugs. Since 1940, chloramphenicol has been used as the gold standard in the treatment of enteric fever, but due to the emergence of resistance, this drug is no longer the drug of choice for the treatment of enteric fever (Niroula et al., 2020). Research conducted by Ahmad et al, 2021 also obtained the same results as Niroula et al, 2020 where *Salmonella typhi* was more sensitive to chloramphenicol with a percentage of 16.28%, than ceftriaxone with a percentage of 8.14% (Ahmad *et al.*, 2021).

In a recent study, a scientist has identified the genetic basis of an XDR-resistant strain of

typhoid fever that emerged in Pakistan. They sequenced the genome of the *Salmonella typhi* XDR strain isolated from the outbreak area. They sequenced the genome of the *Salmonella typhi* XDR strain isolated from the outbreak area. Genome sequencing revealed that all containing the H58 gene confer resistance to chloramphenicol, ampicillin, and trimetropin. Further analysis showed that they harbored a plasmid (IncY) carrying the blaCTX-M15 that mediates resistance to ceftriaxone and fluoroquinolones (MEMON *et al.*, 2020).

From various results in 15 reviewed journals, the most obtained results were that *Salmonella typhi* was more sensitive to ceftriaxone than chloramphenicol. The occurrence of sensitivity to ceftriaxone is caused by a decrease in fever in a short time. This is in line with the mechanism of ceftriaxone which can inhibit bacterial cell wall synthesis, causing bacterial cell death and a rapid decrease in fever. Meanwhile, chloramphenicol experienced resistance due to genome sequencing which revealed that all containing the H58 gene provided resistance to chloramphenicol. In addition, increased resistance to chloramphenicol is also caused by mobile genetic unit (including plasmids, gene cassettes in integrons and transposons), inadequate access to effective drugs, and brief antimicrobial therapy (Awol *et al.*, 2021) especially in developing countries like Ethiopia. But there is a little information about prevalence and factors association with *S. typhi* and its antimicrobial susceptibility pattern in Ethiopia especially in the study area. The aim of this study was to determine the prevalence of *S. typhi* infection, its associated factors and antimicrobial susceptibility pattern among patient with a febrile illness at Adare General Hospital, Hawassa, Southern Ethiopia. Methods: Hospital based cross sectional study was conducted among 422 febrile patients from May 23, 2018 to October 20, 2018. A 5 ml venous blood was collected from each febrile patient. Culture and biochemical test were performed for each isolate. Antimicrobial susceptibility testing was performed for each isolate using modified Kirby-Bauer disk diffusion techniques. Result: In this study, the prevalence of *S. typhi* among febrile illness patients at Adare General Hospital was 1.6% [95% confidence interval (CI).

CONCLUSION

Salmonella typhi bacteria are more sensitive to ceftriaxone than chloramphenicol. Ceftriaxone is said to be more sensitive because of its shorter time in reducing fever. Meanwhile, chloramphenicol resistance occurs due to the presence of the H58 gene, mobile genetic units, inadequate access to effective drugs, and short antimicrobial therapy.

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Survival Analysis in Patients with Dengue Hemorrhagic Fever (DHF) using Weibull Parametric Model in Indonesia: Case Study at the Regional General Hospital (RSUD) Makassar

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ABSTRACT

Purpose: This research is to know the general description of the characteristics of DHF patients and to find out the factors that most influence the cure rate and the length of time for DHF patients who are hospitalized until they are declared cured.

Methodology: The data used in this study were secondary data regarding the criteria for DHF patients obtained from the medical records of the Regional General Hospital (RSUD) Makassar in 2015. This case study of DHF patients is based on 7 characteristics, starting from age, gender, hemoglobin, leucocyte, hematocrit, platelet, and body temperature.

Results: The characteristic DHF patients starting from the length of time DHF patients were hospitalized for ≤ 5 days (71.43%) and > 5 days (28.57%), the age of the patients ≤ 16 years (53.33%) and > 16 years (46.67%), the sex of the patients were male (52%) and female (48%), the hemoglobin of the patients ≤ 15 g/dl (69.52%) and > 15 g/dl (30.48%), the leukocytes of the patients $\leq 4/\mu\text{l}$ (42.86%) and $> 4/\mu\text{l}$ (57.14%), the hematocrit of the patients of $\leq 42\%$ (68.57%) and $> 42\%$ (31.43%), the platelet of the patients $<$ normal (89.52%) and normal (10.48%), and the body temperature of the patients $\leq 38^\circ\text{C}$ (48.57%) and $> 38^\circ\text{C}$ (51.43%). This research uses Weibull parametric model to calculate survival analysis. The calculation shows that the best significant model only involves platelets and body temperature where the result of the AFT model, DHF patients with normal platelets will speed up the recovery rate after treatment and give a survival time of 1.4134 times longer than DHF patients with $<$ normal platelets and DHF patient with body temperature $> 38^\circ\text{C}$ will accelerate the recovery rate after treatment and provide a survival time of 1.1266 times longer than DHF patients with body temperature $\leq 38^\circ\text{C}$. The result of the PH model, DHF patients with normal platelets, the risk of recovery after treatment of 0.8988 times than to DHF patients with $<$ normal platelets and DHF patients with body temperature $> 38^\circ\text{C}$ will get the risk of recovery after treatment of 0.9642 times than of DHF patients with body temperature $\leq 38^\circ\text{C}$.

Applications/Originality/Value: Data from the medical records of the Regional General Hospital (RSUD) Makassar is useful for this study because this data can provide information to the public about how the characteristics and factors that can affect the cure rate of DHF patients. In this study, a comprehensive discussion of dengue cases has been discussed.

INTRODUCTION

Bappenas (2016) states that Sustainable Development Goals (SDGs) focus on sustainable improvement in the economic welfare of the community, the sustainability of the social life of the community, the quality of the environment, ensures justice, and the implementation of governance that can maintain the improvement of the life quality. Indonesia is one of 193 countries that has been approving the SDGs Agenda in 2015. The SDGs consist of 17 goals and 169 targets related to sustainable development issues. In the SDGs, the 3rd goal is to ensure healthy lives and promote well-being for all at all ages. The development of the health sector for the SDGs is highly dependent on the active role of all stakeholders, both the central and local governments, parliament, the business world, mass media, social institutions, professional and academic organizations, development partners, and the United Nations (UN). The biggest challenge in implementing the sustainable development agenda in Indonesia is the reformulation of the concept of integrated development and the placement of health as a series of development management processes that include input, process, output, outcome, and impact of development as well as understanding together with the substance of health development

that must be implemented together. By 2030, end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases, and combat hepatitis, waterborne diseases, and other communicable diseases.

Dengue Hemorrhagic Fever (DHF) is a global virus threat that can attack human health. This virus is one of the most common viruses in tropical countries and is still a major problem in recent years. It is estimated that 390 million of these viruses occur annually worldwide (Bhatt et al., 2013). Data from 76 countries show a substantial increase in dengue cases, with the number of cases more than doubling with the highest cases reported in Asian countries (Stanaway et al., 2016). Currently, this virus has spread throughout the world, including in WHO areas such as the Pan American Health Organization (PAHO), Southeast Asia Regional Office (SEARO), and the Western Pacific Region Office (WPRO) (Brady et al., 2012). WHO (2009) states that the Asia Pacific bears 75 percent of the burden of dengue fever in the world between 2004 and 2010 and Indonesia is the country with the highest incidence of DHF in Southeast Asia since 1968-2009 and the second country in terms of cases of dengue virus spread based on Incidence Rate (IR) and Case Fatality Rate (CFR) where the IR in 2015 reached 50.75 per 100,000 population or an increase of 10.95 per 100,000 population from the previous year (Ministry of Health Indonesia, 2018).

In general, this virus is easy to develop in areas with a tropical climate, one of which is Indonesia. This is very suitable for the development of diseases, especially diseases with organisms that spread pathogenic agents from reservoirs to reservoirs. This virus is one of the viruses caused by mosquitoes with species *Aedes aegypti* and *Aedes albopictus* and is endemic in almost all regions (Kraemer et al., 2015). One of the areas affected by this virus is Makassar in South Sulawesi where there are 1735 cases of this virus and the highest case on the Sulawesi Island (Ministry of Health Indonesia, 2018). The spread of cases of this virus in Makassar occurred from 2002-2012 and tends to grow up and down. The highest number of cases of this virus occurred in 2002 with a total of 1445 cases. However, cases increased again by 5030 cases with 48 deaths in 2013 (Department of Health Makassar, 2014). This causes DHF to be one of the interesting objects to be studied and studied further. Seeing the increasing number of DHF cases with high mortality rates, a study is needed to determine the length of time DHF patients survive to recover. The application of statistical methods that can be used to analyze the case is survival analysis. Kleinbaum et al. (2012) state that survival analysis is a statistical analysis that is specifically used to analyze data or cases related to the time or length of time until a particular event occurs. This analysis is usually used in the health field. There are several models used for survival data analysis. These methods include the parametric survival model, nonparametric survival model, and semiparametric survival model. The parametric survival model assumes that the underlying distribution of survival times follows a certain distribution, such as the parametric proportional hazard model and accelerated failure time model. The nonparametric survival model is used if the data used does not follow a certain distribution that already exists, such as the Kaplan-Meier method and log-rank test. On the other hand, the semiparametric survival model is a model that is often used in research in the health sector, especially the cox proportional hazard regression method. This model is a safe model to choose when in doubt about choosing a parametric model, so there is no need to be afraid of choosing the wrong parametric survival model and more flexible for use in the health case study.

Survival analysis in this study uses a parametric survival model, namely a parametric regression model where parametric here is the number of parameters in a finite multiple regression model (Danardono, 2012). Furthermore, the parametric survival model is a model whose survival time is assumed to follow a known distribution (Harlan, 2017), while regression is a method used to determine the effect of the independent variable on the dependent variable (survival time). Parametric regression models often use the assumption of survival time following the Weibull, Exponential, and so on (Zhang, 2016). Several studies have been conducted regarding cases of the spread of DHF starting from Handayani et al. (2017) were to determine the modeling of cases of the spread of DHF using the cox proportional hazard model in a case study at the Hospital Clinic Jember, then Annas

et al. (2019) which determined the modeling of cases of the spread of DHF using the cox proportional hazard model in a case study at the Regional General Hospital (RSUD) Makassar, and Prabaningrum et al. (2020) which explains and analyzes cases of the spread of DHF based on the theory of planned behavior. Meanwhile, many studies related to parametric models in survival analysis have been carried out, such as in Faruk et al. (2018) which uses the Weibull parametric proportional hazard model in the case of the first birth interval, and Saeed et al. (2020) used a Weibull parametric model for partly censored interval data in a breast cancer case study. Researches on the use of the parametric Weibull model are still not widely carried out in Indonesia, so a more in-depth study is needed. Therefore, the purpose of this study is to explain the general description of the characteristics of DHF patients who are hospitalized, to find out the factors that most influence the recovery rate of DHF patients, and to find out the length of time for DHF patients to be declared cured.

METHODOLOGY

Study Area

The object of research in this study were patients diagnosed with DHF virus in Regional General Hospital (RSUD) Makassar in 2015. Makassar is the capital of the province of South Sulawesi. It is the largest city in the region of Eastern Indonesia and the country's fifth-largest urban center after Jakarta, Surabaya, Bandung, and Medan (Ministry of Home Affairs Indonesia, 2013). The city's area is 175.77 km², and it had a population of around 1,424 million in 2020 (Hajramurni, 2011).

Dengue Hemorrhagic Fever (DHF)

WHO (1997) explains that DHF is the leading cause of viral hemorrhagic fever worldwide. Karyanti et al. (2014) describe that DHF was defined as having at least the first two of the following four clinical manifestations, such as sudden onset acute fever of 2 to 7 days duration; spontaneous hemorrhagic manifestations or a positive Tourniquet test; hepatomegaly; and circulatory failure, in combination with hematological criteria of thrombocytopenia ($\leq 100,000$ cells/mm³) and an increased hematocrit over 20 percent. Li et al. (2018) state that DHF is transmitted by the bite of female *Aedes Aegyptus* mosquito or female *Aedes albopictus* mosquito by carrying dengue virus into the genus Flavivirus. Stöppler (2021) states that DHF is a syndrome due to the dengue virus that tends to affect children under 10, causing abdominal pain, hemorrhage (bleeding), and circulatory collapse (shock). DHF starts abruptly with high continuous fever and headache plus respiratory and intestinal symptoms with a sore throat, cough, nausea, vomiting, and abdominal pain.

Characteristic Data

The data used in this study were secondary data regarding the criteria for DHF patients obtained from the medical records of the Regional General Hospital (RSUD) Makassar in 2015. DHF is a disease caused by the dengue virus that is transmitted through the bites of mosquitoes *Aedes aegypti* and *Aedes albopictus*. In humans, transmission can only occur when the body is in a state of viremia which is between 3-5 days (Wang et al., 2020). To get a higher accuracy of diagnosis, laboratory tests are generally carried out, such as counting the number of antibodies against the dengue virus, and complete blood counts such as hemoglobin, leukocytes, hematocrit, and platelet (Annas et al., 2019). This case study of DHF patients is based on 7 characteristics, starting from age, gender, hemoglobin, leucocyte, hematocrit, platelet, and body temperature. The data used describe the characteristics of DHF patients who are hospitalized, the factors that most influence the recovery rate of DHF patients, and the length of time for DHF patients to be declared cured.

Table 1. Characteristic DHF Patients

| Code | Variable | Description | Category |
|----------------|------------------|--|----------------------------------|
| (1) | (2) | (3) | (4) |
| T | Time | Time is a condition until the occurrence of the desired event. The time variable used in this study was the length of time the patient was hospitalized until he was declared cured at Regional General Hospital (RSUD) Makassar. | - |
| X ₁ | Age | Age is the span of life measured in years The age variable used in this study was the age of DHF patients at the beginning of admission to hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = > 16 years 0 = ≤ 16 years |
| X ₂ | Gender | The gender variable used in this study was the sex of DHF patients which is classified into two categories (male and female) and hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = male 0 = female |
| X ₃ | Hemoglobin | Hemoglobin is a protein found in red blood cells present in erythrocytes and plays an important role in transporting oxygen throughout the body, giving color to the blood, transporting carbon dioxide back to the lungs, and maintaining the shape of red blood cells. The hemoglobin variable used in this study was the hemoglobin level of DHF patients undergoing hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = > 15 g/dl 0 = ≤ 15 g/dl |
| X ₄ | Leucocyte | Leukocytes are white blood cells that are part of the immune system and function to protect themselves from infection or disease and are produced from hematopoietic stem cells in the bone marrow. The leukocytes variable used in this study was the level of the leukocytes of DHF patients undergoing hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = > 4 /μl 0 = ≤ 4 /μl |
| X ₅ | Hematocrit | Hematocrit is the level of red blood cells in the blood and shows the percentage ratio of red blood cells to blood volume. Red blood cells have an important role in the health of the body, namely as a carrier of oxygen and nutrients to all parts of the body and hematocrit is a number that shows the percentage of solids in the blood to blood fluids. In general, the decrease in platelets precedes the increase in the hematocrit, with an increase of 20 percent or more from baseline. The hematocrit variable used in this study was the hematocrit level of DHF patients undergoing hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = > 42% 0 = ≤ 42% |
| X ₆ | Platelets | Platelet is cytoplasmic fragments without a nucleus 2-4 μm in diameter biconvex disc that forms in the bone marrow and has an important role in the blood clotting process when an injury occurs so that the blood stops immediately. The platelet variable used in this study was the number of thrombocytes of DHF patients which is classified into two categories below normal and normal (150,000-400,000/mm ³) and hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = normal 0 = < normal |
| X ₇ | Body Temperature | Body temperature is a measure of the body's ability to produce and get rid of heat. The high or low body temperature of a person can also be an indicator of his health condition. The body temperature variable used in this study was the temperature level of DHF patients undergoing hospitalization at Regional General Hospital (RSUD) Makassar. | 1 = > 38°C 0 = ≤ 38°C |

Survival Analysis

Prentice et al. (2001) describe that survival analysis, sometimes referred to as failure-time analysis, refers to the set of statistical methods used to analyze time-to-event data. Time-to-event or failure-time data, and associated covariate data, may be collected under a variety of sampling schemes, and very commonly involve right censoring. The distribution of a failure-time variate is usefully characterized in terms of its conditional failure rate, or hazard function. Collett (2003) states that the survival analysis is a time-related data analysis, from the beginning to the occurrence of a specific event. Duration from the beginning of the observation (time origin) until the occurrence of a special event (failure event) is called the time of survival. The particular event (failure event) may be a failure, death, relapse, or recovery from an illness, a response from an experiment, or another event chosen according to the researcher's interest. Arsene et al. (2007) explain that survival analysis is an important part of medical statistics, frequently used to define prognostic indices for mortality or recurrence of a disease, and to study the outcome of treatment. Kleinbaum et al. (2010) state that survival analysis is very concerned about data censors. Data censor occurs if the object does not experience an event before the observation ends, the object disappears during observation, and the individual object is terminated due to death or due to other reasons. Jakperik et al. (2012) explain that in survival analysis, there is a term failure (even though the actual event may be successful) which is an event where the desired event is recorded. In determining the survival time, there are three factors needed, such as the start time of recording (star point) is the initial time when recording is done to analyze an event, the end-point of recording is the time when the recording ends. This time is useful for knowing the censored or uncensored status of a patient to be able to perform the analysis, and the measurement scale is the limit of the time of the incident from the beginning to the end of the event. The scale is measured in days, weeks, or years.

Parametric Survival Model

A parametric survival model is a model whose outcome (survival time) follows a certain theoretical distribution. Usually, the theoretical distributions that are widely used in survival analysis are the Exponential distribution, Weibull distribution, Lognormal distribution, Gamma distribution, and Log-Logistic distribution. The advantages of the parametric survival model include the predictable distribution of survival time; the full maximum likelihood can be used to estimate the parameters; (residuals can represent the difference between the observed and estimated time values; and the estimated parameters can provide a meaningful estimate of the effect (Zhang, 2016).

Weibull Parametric Model

One of the most useful models for analysis and modeling is the Weibull parametric model which is useful in various fields such as medicine, biology, engineering, and others (Saeed et al., 2020). This model was originally proposed by Weibull in 1939. This model is a generalization of the exponential parametric model. Lee et al. (2003) proposed that the Weibull parametric model is widely used in the study of human disease. This model does not assume a constant hazard rate and its use is wider than the exponential distribution. Let T is a random variable data length of time the patient was hospitalized until he was declared cured in Weibull distribution with the parameter is λ , then the probability density function of T is defined as follows (Kleinbaum et al., 2005).

$$f(t) = \lambda \gamma t^{\gamma-1} \exp(-\lambda t^\gamma) \quad (1)$$

Based on the equation, the survival function of T is obtained as follows:

$$s(t) = \exp(-\lambda t^\gamma) \quad (2)$$

The cumulative distribution function of the random variable T with the Weibull distribution is as follows:

$$F(t) = 1 - \exp(-\lambda t^\gamma) \quad (3)$$

The hazard function of the random variable T with the Weibull distribution is as follows:

$$h(t) = \lambda \gamma t^{\gamma-1} ; \lambda > 0 \text{ dan } \gamma > 0 \quad (4)$$

Evaluation Criteria

Hosmer et al. (2008) explain that testing for the significance of parameters using simultaneous test and partial test. To test the hypothesis of β_k is zero, it can use a simultaneous test with the likelihood ratio test. This test statistic follows a chi-square distribution with a degree of freedom p. The hypothesis used in the simultaneous test is as follows:

$$H_0: \beta_1 = \beta_2 = \dots = \beta_k = 0$$

$$H_1: \text{at least one } \beta_k \neq 0, \text{ with } k = 1, \dots, 7$$

Rejection of H_0 if p-value $< \alpha$ means that there is at least one independent variable that affects survival time. Meanwhile, the partial test is then used to know the partial effect of each independent variable on the dependent variable. The hypothesis used in the partial test is as follows:

$$H_0: \beta_k = 0, \text{ with } k = 1, \dots, 7$$

$$H_1: \beta_k \neq 0, \text{ with } k = 1, \dots, 7$$

Rejection of H_0 if p-value $< \alpha$ which means that independent variable that affects survival time.

Furthermore, according to that the selection of the best models using *Akaike Information Criterion* (AIC). The best model has the smallest AIC value. The selection of the best Weibull parametric model is done by selecting the variables which can be done in many ways, such as the forward selection method is done by entering predictor variables gradually based on the largest partial correlation. In the forward selection method, the predictor variables included in the model cannot be removed again, while the backward elimination method is done by entering all predictor variables and then eliminating one by one until only significant predictor variables remain, and the stepwise method is a combination of the two methods, namely forward selection method and backward elimination method. At each stage, a variable can be included or excluded from the model. These three methods, namely forward selection, backward elimination, and stepwise, have the same goal, which is to reduce the possibility of multicollinearity in the resulting equation or model.

Data Analysis

The purpose of this study was to describe the general description of characteristics of DHF patients who were hospitalized. In knowing the general description of the characteristics of DHF patients, descriptive analysis can be done. Visualization of descriptive analysis can be in the form of histograms, pie charts, bar charts, or tables that include information on the mean, standard deviation, minimum and maximum values for each indicator. Second, knowing the factors that most influence the cure rate of DHF patients. In this case, it can be seen from the calculation results of the Weibull parametric model based on existing concepts and theories. Finally, knowing the length of time for a DHF patient to be declared cured. In this case, it can be seen from the AFT model and PH model that can accommodate factors related to survival time.

Accelerated Failure Time (AFT) and Proportional Hazard (PH)

The parametric survival model consists of 2 types of survival models, namely the Proportional Hazard (PH) Model and the Accelerated Failure Time (AFT) Model where the PH Model interprets the comparison between individual hazard values and the AFT Model interprets the comparison between individual survival times. The distribution in the parametric model is more used to form the AFT model than the PH model. Only two models can accommodate both (AFT model and

PH model), namely Exponential distribution and Weibull distribution. Meanwhile, the Lognormal distribution, Gamma distribution, and Log-Logistic distribution can only accommodate the AFT model. Wei (1992) states that the parametric AFT model provides an alternative to the PH model for statistical modeling of survival data. Orbe et al. (2002) described that the AFT model could be an interesting alternative to the PH model when the PH assumption did not hold. Implementation and interpretation of the results of AFT were simple. Saikia et al. (2017) explain that the AFT model is parametric and has the assumption that the effect of covariates act multiplicatively (proportionally) for the survival time. Though the parametric models are linear regression models, the difference between the linear regression model and the survival regression model is that in the case of the survival model the censored observations are considered.

RESULTS AND DISCUSSION

In general, the number of DHF patients has increased since 2015 and has a fairly high risk of death. This is considered worrying about the survival of patients in the future. Therefore, efforts are needed to overcome the increase in DHF patients, especially in Makassar. One of the efforts that can be done is to look at the cure rate in DHF patients, one of which is in the Regional General Hospital (RSUD) Makassar. The factors used as a reference in observing the cure rate of DHF patients, namely age, gender, body temperature, results of laboratory tests such as hemoglobin, leukocytes, hematocrit, and platelets. In general, it can be seen that the average age of DHF patients is 17 years with hospitalization for 5 days. Body temperature at the time of average 38°C, and the laboratory results show that the leukocyte count was 5.3/ μ l, the hemoglobin count was 14 g/dl, and the hematocrit was 39 percent.

The length of time the patients analyzed in this data was the length of time the patient was hospitalized until he was declared cured. It can be seen that the percentage of the length of time DHF patients were hospitalized for ≤ 5 days was 71.43 percent and 28.57 percent were hospitalized for more than 5 days. The age of the patients analyzed in this data is the age of life measured in years, where the age of the DHF patient when being treated. It can be seen that the percentage of DHF patients aged ≤ 16 years is 53.33 percent and 46.67 percent are over 16 years. The sex of the patients analyzed in this data were male and female patients who were registered in the medical records of DHF patients. It can be seen that the percentage of DHF patients is male by 52 percent and 48 percent is female. The hemoglobin of the patients analyzed in this data is a complex protein in erythrocytes that contains iron and the color is red. It can be seen that the percentage of DHF patients who have hemoglobin ≤ 15 g/dl is 69.52 percent and 30.48 percent have hemoglobin more than 15 g/dl. The leukocytes of the patients analyzed in this data are blood cells that are part of the immune system and function to protect themselves from infection or disease. It can be seen that the percentage of DHF patients who have leukocytes $\leq 4/\mu$ l is 42.86 percent and 57.14 percent have leukocytes more than 4/ μ l. The hematocrit of the patients analyzed in this data is a number that indicates the percentage of solids in the blood to blood fluids. It can be seen that the percentage of DHF patients who have a hematocrit of ≤ 42 percent is 68.57 percent and 31.43 percent have a hematocrit of more than 42 percent. The platelets of the patients analyzed in this data are cytoplasmic fragments without a nucleus with a diameter of 2-4 μ m in the form of biconvex discs that form in the bone marrow and have an important role in the blood clotting process when an injury occurs so that the blood stops immediately. Under normal conditions, the platelet count is between 150000-400000/ mm^3 . A decrease in the platelet count to 100,000 mm^3 , is usually found between the third and seventh day of illness. Platelet needs to be repeated until it is proven that the platelet count is within normal limits or decreasing. It can be seen that the percentage of DHF patients who have below normal platelets is 89.52 percent and 10.48 percent have normal platelets. The body temperature of the patients analyzed in this data is the temperature of the DHF patients who are hospitalized. It can be seen that the percentage of DHF patients who have a body temperature of $\leq 38^\circ\text{C}$ is 48.57 percent and 51.43 percent have a body temperature of more than 38°C.

In determining the distribution of survival time data, namely the length of time hospitalized until declared cured. To determine the type of distribution of the data, look at the AIC value. It can be seen that the Weibull parametric model has a lower AIC value of 400.71 than the Exponential parametric model which has an AIC value of 547.23. That means the best model of this research is the Weibull parametric model.

Table 2. AIC of the Parametric Survival Models

| Scenario | Model | AIC |
|----------|------------------------------|--------|
| (1) | (2) | (3) |
| 1 | Exponential Parametric Model | 547.23 |
| 2 | Weibull Parametric Model | 400.71 |

Parameter estimation in the Weibull parametric model can be calculated using by the Maximum Likelihood Estimator (MLE). In parameter testing, including simultaneous testing and partial testing. Simultaneous parameter estimation testing is carried out by looking at the output results of research data processing, namely the G test. Simultaneous parameter testing is carried out to determine the effect of the independent variables in the study on the dependent variable simultaneously, where the results obtained that the G test value is 19.96 with a p-value of 0.0056 smaller than the level significance of 0.05 which means that there is at least one significant variable or it can be interpreted that there is at least one independent variable that affects survival time in this study or it can be concluded as a whole, there is at least one variable that can contribute to the recovery rate of DHF patients.

Table 3. Partial Test Weibull Parametric Model

| Code | Variable | Model AFT | p-value |
|----------------|----------------------------------|-----------|---------|
| (1) | (2) | (3) | (4) |
| | Intercept | 1.5567 | 0.0000* |
| | Age | | |
| X ₁ | 1 = > 16 years 0 = ≤ 16 years | 0.0094 | 0.8831 |
| | Gender | | |
| X ₂ | 1 = male 0 = female | 0.0578 | 0.3987 |
| | Hemoglobin | | |
| X ₃ | 1 = > 15 g/dl 0 = ≤ 15 g/dl | 0.0985 | 0.3070 |
| | Leucocyte | | |
| X ₄ | 1 = > 4 /μl 0 = ≤ 4 /μl | -0.0019 | 0.9772 |
| | Hematocrit | | |
| X ₅ | 1 = > 42% 0 = ≤ 42% | -0.1338 | 0.1826 |
| | Platelet | | |
| X ₆ | 1 = normal 0 = below normal | 0.2867 | 0.0066* |

| Body Temperature | | | |
|------------------|-------------------------------|--------|--------|
| X_7 | 1 = $> 38^{\circ}\text{C}$ | 0.1190 | 0.0650 |
| | 0 = $\leq 38^{\circ}\text{C}$ | | |

*significance of 0.05

While Table 3 shows the results of the partial test, it can be seen that the intercept and platelets have a p-value of less than 0.05, so it can be concluded that platelets can make a significant contribution to the cure rate of DHF patients. Based on the results, the researcher looks that it is necessary to select the Weibull parametric model, one of them is the backward selection method. It begins by eliminating one by one the variables according to the significance criteria and to select the best model, the smallest AIC value of the model will be considered.

Based on Table 4 shows that the selection of the best model In the first step enters all variables into the model, then for the second step and so on, removing the variables one by one, so that from output results, the process stops at the eighth step, where the model formed is a model with no variable age (X_1), gender (X_2), hemoglobin (X_3), leukocytes (X_4), and hematocrit (X_5) with the lowest AIC value of 392.84.

Table 4. Best Weibull Parametric Model

| Scenario | Variable | AIC |
|----------|--|--------|
| (1) | (2) | (3) |
| 1 | All variable | 400.71 |
| 2 | Reduction leucocyte (X_4) | 398.71 |
| 3 | Reduction age (X_1) and leucocyte (X_4) | 396.73 |
| 4 | Reduction age (X_1), gender (X_2), and leucocyte (X_4) | 395.47 |
| 5 | Reduction age (X_1), gender (X_2), hemoglobin (X_3), and leucocyte (X_4) | 394.62 |
| 6 | Reduction age (X_1), gender (X_2), hemoglobin (X_3), leucocyte (X_4), and hematocrit (X_5) | 392.84 |

Parameter estimation in the Weibull parametric model can be calculated using by Maximum Likelihood Estimator (MLE). In parameter testing, including simultaneous testing and partial testing. Simultaneous parameter estimation testing is carried out by looking at the output results of research data processing, namely the G test. Simultaneous parameter testing is carried out to determine the effect of the independent variables in the study on the dependent variable simultaneously, where the results obtained that the G test value is 17.83 with a p-value of 0.0001 smaller than the level significance of 0.05 which means that there is at least one significant variable or it can be interpreted that there is at least one independent variable that affects survival time in this study or it can be concluded as a whole, there is at least one variable that can contribute to the recovery rate of DHF patients.

Table 5. Partial Test Best Weibull Parametric Model

| Code | Variable | Model AFT | Model PH | p-value |
|-------|------------------|-----------|----------|---------|
| (1) | (2) | (3) | (4) | (5) |
| | Intercept | 1.5842 | -0.4848 | 0.0000* |
| | Platelet | | | |
| X_6 | 1 = normal | 0.3460 | -0.1056 | 0.0004* |
| | 0 = $<$ normal | | | |

| Body Temperature | | | | |
|------------------|-------------------------------|--------|---------|---------|
| X_7 | $1 = > 38^{\circ}\text{C}$ | 0.1192 | -0.0365 | 0.0481* |
| | $0 = \leq 38^{\circ}\text{C}$ | | | |

*significance of 0.05

Based on the AFT (Accelerated Failure Time) model, it can be seen that on the platelet variable, the value of $\exp(0.3460) = 1.4134$ which means that every DHF patient with normal platelets will speed up the recovery rate after treatment and give a survival time of 1.4134 times longer than DHF patients with below-normal platelets and for the body temperature variable, the value of $\exp(0.1192) = 1.1266$ which means that every DHF patient with body temperature $> 38^{\circ}\text{C}$ will accelerate the recovery rate after treatment and provide a survival time of 1.1266 times longer than DHF patients with body temperature $\leq 38^{\circ}\text{C}$. Meanwhile, based on the PH (Proportional Hazard) model, it can be seen that on the platelet variable, the hazard ratio of $\exp(-0.1056) = 0.8998$, which means that every DHF patient with normal platelets, the risk of recovery after treatment is 0.8988 times compared to DHF patients with below-normal platelets and for the body temperature variable, the hazard ratio of $\exp(-0.0365) = 0.9642$ which means that every DHF patient with body temperature $> 38^{\circ}\text{C}$ will get the risk of recovery after treatment to be 0.9642 times that of DHF patients with body temperature $\leq 38^{\circ}\text{C}$.

CONCLUSION

Dengue Hemorrhagic Fever (DHF) is a global virus threat that can attack human health. This virus is easy to develop in areas with a tropical climate, one of which is Indonesia. Indonesia is the country with the highest incidence of DHF in Southeast Asia since 1968-2009. Seeing the increasing number of DHF cases with high mortality rates, a study is needed to determine the length of time DHF patients survive to recover. The application of statistical methods that can be used to analyze the case is survival analysis. This research uses the Weibull parametric model to calculate survival analysis. The calculation shows that the best significant model only involves platelets and body temperature where the result of the AFT model, DHF patients with normal platelets will speed up the recovery rate after treatment and give a survival time of 1.4134 times longer than DHF patients with below-normal platelets and DHF patients with body temperature $> 38^{\circ}\text{C}$ will accelerate the recovery rate after treatment and provide a survival time of 1.1266 times longer than DHF patients with body temperature $\leq 38^{\circ}\text{C}$. The result of the PH model, DHF patients with normal platelets, the risk of recovery after treatment of 0.8988 times compared to DHF patients with below-normal platelets and DHF patients with body temperature $> 38^{\circ}\text{C}$ will get the risk of recovery after treatment of 0.9642 times that of DHF patients with body temperature $\leq 38^{\circ}\text{C}$.

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Validity comparison between Moyers and Sitepu methods in the Javanese children of 11-14 years old

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ABSTRACT

Aim: This study aims to compare the validity between Moyers and Sitepu methods in the Javanese children of 11-14 years old.

Method: 50 children of 11-14 years old in SMP Al Islam 1 Surakarta that suitable to the study sampling criteria, upper and lower jaw were molded. The result of jaw molds as a study model was used as research samples for direct measurement using Moyers and Sitepu methods with a sliding caliper. The three results were recorded and analyzed using the statistic test of Kruskal-Wallis and post hoc Mann Whitney.

Study result: There is no difference in direct measurement result with Moyers method on the lower jaw ($p > 0.05$) and there is a difference in direct measurement result with Moyers method on the upper jaw ($p < 0.05$).

Conclusion: Sitepu method is valid for the upper and lower jaw and the Moyers method is valid for the lower jaw of Javanese children of 11-14 years old.

INTRODUCTION

Malocclusion is a problem found in dentofacial development and many malocclusion cases are found in mixed dentition periods. The mixed dentition period is transitional dentition or transition from the primary dentition to the permanent dentition. In this phase, there is a mixture of primary and permanent teeth in the oral cavity (Brahmanta (2015); Kurnia et al. (2021)).

The mixed dentition period is important in the growth and development of occlusion because most malocclusions are found in this period. Interceptive treatment is needed to prevent severity or remove malocclusion in the future. The dentist needs to determine the diagnosis and the treatment plan of the malocclusion case. Space analysis in mixed dentition is a method for predicting mesiodistal width in unerupted permanent teeth, namely canines, first premolars, and second premolars (C, P1, P2), whether using radiography or not. The analysis result is as a discrepancy model of the gap between available space with required space for teeth eruption of permanent teeth. Available space is a space in which the eruption of permanent teeth with a proper place from first mesial molar of right permanent to first mesial molar of left permanent. This discrepancy will determine the choice of the type of patient treatment as space maintenance, space regaining, serial extraction, or periodic observation (Amalia et al. (2012); Baktir et al. (2020); Djafar & Pudyani (2006); Giri et al. (2018)).

Moyers method is using a probability table to estimate the space needed to predict canine teeth, first premolar, and permanent second premolar (C-P1-P2) of the upper and lower jaw with a sum predictor of four permanent incisors on the lower jaw. Moyers is using a prediction table with a percentile of 75% because considered global and secure from malocclusion. Moyers table is the most extensively used table because it has some advantages such as; it has a minimum error, it can be used by both dentist and beginner, it does not take a long time to make, it does not need the radiographic image, and it can be used for both upper and lower jaw. This probability table is based on the data collected in the study on the North American Caucasoid race so that the accuracy of this method is questionable when applied to other races (Bhatnagar et al. (2017); Kurnia (2021); Maroli et al. (2015)).

Another method used to compare other validity is the Sitepu method. The Sitepu method is also usually used to analyze the space needed by adding up the four mandibular incisors and then entering into the formula. The results of the measurement of the teeth showed the mesiodistal number of C-P1-P2 on one side. This formula has been studied in 215 children with the Deutro-Malay race in 1983 (Rahardjo, 2008). Although the Sitepu method is accurate, the accuracy value can be disturbed if the measurements are not appropriate (Wiyono et al., 2016).

Race is one of the factors that affect teeth malocclusion. Javanese race is the biggest race on Java Island. This race is a Deutro-Malay sub racial group that has certain physical characteristics, including a mesocephalic to brachycephalic head shape, a concave nose profile, slightly thick lips, dark brown eye color, black hair color, straight or curly hair shape, and brown skin color. In Javanese children, in general, the frontal direction is oval in shape for the highlands and round for the lowlands, while the sagittal direction is convex in both the lowlands and highlands. The Javanese have a flat dome of the palate with the palate tends to be wide and the mesiodistal width of males is larger than that of females. The presence of dietary factors and living habits, jaw structure which is influenced by tooth shape results in byzygomatic width and will affect the overall face size (Paramesthi (2011); Sukadana (1976); Sutardjo (2003)). Based on the description above, the researcher wanted to know the validity of the Moyers and Sitepu method on Javanese children aged 11-14 years.

RESEARCH METHOD

The research sample of the upper and lower jaw was molded using a mold that was adjusted to the size of the arch of the jaw. The subjects of this study were 50 children aged 11-14 years at SMP Al Islam 1 Surakarta. The criteria for the research subjects were to have complete mandibular incisors and clinically good morphology, were Javanese children of at least 2 generations above (Father, Mother, Grandfather, and Grandmother), permanent canines-first premolars-second premolars (C-P1-P2) has erupted and has no caries in the maxilla or mandible, is cooperative for the study model molding, and is not currently under orthodontic treatment. Research permits, ethical clearance, and informed consent were obtained before the research was conducted.

The upper and lower jaws of the study samples were impressed using a mold that was adjusted to the size of the arch of the jaw. Alginate impression material is mixed with water according to the specified ratio and stirred with a spatula in a rubber bowl. Alginate that has been stirred must be homogeneous. Homogeneous alginate is placed on a tray that has been prepared according to size and inserted into the oral cavity of the research subject in the upper and lower jaws to obtain negative impressions. The impressions were then filled with gypsum stone to get a positive impression, then planted in boxing using plaster casts and used as a study model for the research sample.

Three kinds of calculation were conducted in the study model namely direct measurement, calculation with Moyers method, and calculation with Sitepu method. Indirect measurement, the total mesiodistal width of the maxillary and mandibular permanent C-P1-P2 teeth was measured directly using a sliding caliper. Measurements were carried out three times for each side and the average value was obtained.

In the calculation with Moyers method, the total mesiodistal width of the four mandibular permanent incisors was measured and recorded. The sum of the four mandibular incisors was matched with the Moyers table with 75% probability by sex to predict the space required for the eruption of teeth C-P1-P2 on each side of the maxilla and mandible.

In the calculation using the Sitepu method, the four mandibular incisors were calculated using the Sitepu formula. The results of the sum of the mesiodistal widths of the mandibular incisors were included in the Sitepu prediction formula so that the Y and Z values were obtained. The Y value was the sum of the mesiodistal widths of the second premolars, first premolars, and canines on one side of the mandible. The Z value is the sum of the mesiodistal widths of the second premolars, first premolars, and canines on one side of the maxilla. From the results of the Y value, it can be

calculated the space needed in the lower jaw by adding the sum of the mesiodistal widths of the lower incisors by twice the Y value, maxilla by twice the Z value.

The result of direct measurement, Moyers method calculation, and Sitepu method calculation was recorded. The three measurement results and methods were compared and analyzed to determine their validity.

RESEARCH RESULT

The result of direct measurement, Moyers method calculation, and Sitepu method calculation on the upper and lower jaw is presented in Table 1. The data analysis in this study was using One Way ANOVA parametric data analysis with the significance of $p < 0.05$ to know the difference between size prediction validity C-P1-P2 based on Moyers and Sitepu method. The test requirement is that the data must be normally distributed. To see the normality of the data, the Shapiro Wilk test was carried out because the sample was ≤ 50 .

Table 1. Average Measurement of the Upper and Lower Jaw

| Measurement and Method | Total Sample | Upper Jaw Average (mm) | Lower Jaw Average (mm) |
|------------------------|--------------|------------------------|------------------------|
| Direct | 50 | 22,39 | 21,61 |
| Sitepu | 50 | 22,58 | 21,25 |
| Moyers | 50 | 21,57 | 21,27 |

Kruskal Wallis's nonparametric test with an accuracy level of 95% ($p < 0.05$) was conducted because the data was not normally distributed. Table 2 shows the result of the Kruskal Wallis test from the group of direct measurements, Sitepu and Moyers on the upper and lower jaw. The upper jaw test shows that $p = 0.000$ ($p < 0.05$) so that the data has a significant difference between the direct measurement, Sitepu method, and Moyers method. The test on the lower jaw shows the result of $p > 0.05$, so there is no significant difference between the direct measurement, Sitepu method calculation, and Moyers method calculation.

Table 2. Kruskal Wallis Test of the Upper and Lower Jaw

| Jaw | Measurement and Calculation | N | Mean Rank | Sig |
|-------|-----------------------------|----|-----------|--------|
| Upper | Direct | 50 | 82,13 | 0,000* |
| | Sitepu | 50 | 94,43 | |
| | Moyers | 50 | 49,94 | |
| Lower | Direct | 50 | 85,20 | 0,152 |
| | Sitepu | 50 | 71,42 | |
| | Moyers | 50 | 69,88 | |

*Significantly different

A post hoc Mann Whitney test was conducted to see the difference between groups in the upper and lower jaw (Table 3). In the upper jaw, direct measurement and Sitepu method calculation have no significant difference ($p > 0,05$) meanwhile in Moyers method is different from the two other measurements and calculation ($p < 0.05$). In the lower jaw, there is no significant difference between groups of direct measurement, Sitepu method calculation, and Moyers method calculation. This result shows that measurement using the Sitepu method is valid for the upper and lower jaw; meanwhile, Moyers method is valid for the lower jaw.

Table 3. Mann Whitney Test of the Upper and Lower Jaw

| Jaw | Measurement | | Sig |
|-------|-------------|--------|--------|
| Upper | Direct | Sitepu | 0,199 |
| | | Moyers | 0,000* |
| | Sitepu | Direct | 0,199 |
| | | Moyers | 0,000* |
| Lower | Direct | Sitepu | 0,086 |
| | | Moyers | 0,104 |
| | Sitepu | Direct | 0,086 |
| | | Moyers | 0,756 |

*Significantly different

DISCUSSION

In space analysis of mixed dentition period, the available space for permanent teeth eruption obtained from direct measurement in the model, meanwhile the needed space not always can be calculated directly from the model if there is an unerupted tooth. The direct measurement method in the model to calculate the needed space is conducted to prevent bias if the measurement is done using a periapical photo, so the sample collected is permanent teeth phase. This will not affect the measurement result because human teeth size is relatively fixed and is not getting bigger with age. The prediction method is needed to calculate the needed space for permanent teeth to erupt. Appropriate analysis method determination should be conducted to carry out the right diagnosis and treatment plan for each malocclusion. Moyers method and Sitepu method are commonly used prediction methods in a measure the needed space (Baktir et al. (2020); Kurnia et al. (2021); Wiyono et al. (2016)).

Prediction tables that have been produced so far have limited clinical benefits because prediction tables for tooth size are only available for certain populations, whereas if used for other populations it will reduce the accuracy of these predictions. Moyers analysis method and Sitepu analysis method show different validity when were used for other populations it will reduce the accuracy of the prediction. Moyers analysis method and Sitepu analysis method show different validity when used for a different race. Both methods also use different races in the prediction result. The Moyers prediction data is carried out from the Kaukasoid race, meanwhile, the Sitepu prediction method is carried out from the Deutro-Malay race, so there are measurement differences in both prediction tables (Baktir et al. (2020); Kurnia et al. (2021)).

According to the research result, the Sitepu prediction method is valid for the upper and lower jaw. This is suitable with a study by Wiyono et al. (2016) that stated if Sitepu prediction method and direct measurement have no significant difference, which means the result of the Sitepu prediction method is quite accurate compared to the result of direct measurement as control. Kurnia et al. (2021) also stated that the Sitepu method was declared valid for the upper and lower jaw of the Minang race. This method and formula are created for the Deutro-Melayu subrace. Javanese is a race that includes to Mongoloid race and belongs to the Deutro-Melayu subrace (Paramesthi, 2011). The characteristics of Deutro-Malay subracial found in Javanese, which shows a pattern of tooth size that is almost the same between populations, and variations in tooth size are determined by genetic factors and environmental influences (Wiyono, 2016). In this research, only Javanese becomes a controlling factor, whereas the factors affecting the mesiodistal width of the teeth were not only race but also gender, genetics, nutrition, environmental factors, and socio-economics (Al-Bitar et al., 2008). The results of this study are not following the research of Baktir et al. (2020) stated that the Sitepu method is valid for predicting the eruption of mandibular C-P1-P2 teeth only.

Moyers prediction method is valid for the lower jaw but invalid for the upper jaw of Javanese. The difference between direct measurement and prediction values from Moyers analysis is 75% on the upper jaw, in this research significantly different as a statistic. Some research conducted to test the validity of Moyers analysis in various ethnic and racial groups shows the heterogeneous result. According to Thimmegowda et al. (2015), the use of Moyers table is accurate for males with the percentile of 50% and female 75%. Moyers table 85% for the upper jaw and 75% for the lower jaw, valid for the male population in China. In females, Moyers table 75% valid for the upper jaw but there is no precise percentile for the lower jaw. Literature shows that there is tooth size variation between men and women where men have bigger sizes than women. Other research declared that precise prediction for Arab Yaman race in Surabaya is Moyers method for the upper jaw. In the Arab population of Pekalongan, Moyers table 75% adequate for the upper jaw but not for the lower jaw. Other research on the Minang race stated that Moyers analysis method is invalid for the lower jaw. Mixed dentition Moyers analysis should be used selectively because its accuracy about probability level is still questionable (Baktir et al. (2020); Chong et al. (2021); Handayani & Hidayah (2019); Kurnia et al. (2021)).

Moyers table prediction analysis requires table renewal of validation once in each generation (30 years) because of the change of malocclusion and teeth size (Al-Kabab, 2014). It can be seen that there is a difference in the validity of the Moyers analysis method and the Sitepu analysis method from the results of previous studies. This is because there is no analytical method that will be completely valid for predicting the mesiodistal width of the canines and premolars (first and second) if used in different samples (Kurnia et al., 2021). Mixed dentition analysis methods require periodic modifications according to region, race, and sex. Modification of the current method is required to obtain accurate results. It is also recommended to have standardized values for the Asian population which will make it easier for dentists to determine an accurate treatment plan for children who need occlusion correction (Ravinthar & Gurunathan, 2020).

CONCLUSION

The Sitepu and Moyers methods can be used for mixed dentition space analysis in Javanese children. The Sitepu method is valid for the upper and lower jaw, meanwhile, the Moyers method is valid for the lower jaw in Javanese children of 11-14 years old.

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Efforts to Increase Family Planning Acceptors as an Indicator of Success in Family Planning Villages in Kembangkuning, Cepogo, Central Java, Indonesia

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ABSTRACT

The Indonesian government in an effort to control population growth and improve the quality of life has formed a family planning program or it can be shortened to FP Villages with the aim of improving the quality of families so that a sense of security, peace and hope for a better future can arise in realizing physical prosperity and inner happiness. This study aim to identify efforts to increase family planning acceptors as an indicator of the success of family planning villages in Kembangkuning Village, Cepogo, Central Java, Indonesia. Design of the research using qualitative descriptive research methods. The sampling technique was carried out by purposive sampling, namely by collecting informants with the considerations used in this study, the informants who were considered to be the most knowledgeable about the problem to be studied. The data used are primary data and secondary data. Data analysis with qualitative techniques with reduction, presentation and conclusion. Results of the study that the increase in the family planning acceptors, the percentage of family activity in participating in group activities is also good, although some activities still need to be increased. Conclusion of this study is success in implementing the FP Villages, apart from being able to alleviate poverty, as well as bringing development closer to the community, FP Villages does not only talk about limiting the population explosion, but also empowers the potential of the community to play a real role in development.

Keywords: Family Planning; Family Planning Acceptors; Family Planning Villages; Indicator Success

INTRODUCTION

The rate of population growth in Indonesia is still increasing from year to year. The results of the Indonesian population census in 2020 were 270.20 million people, an increase of 32.56 million people compared to the 2010 population census. Meanwhile, the results of the 2020 population census of Central Java province were 36.52 million people with a productive age population of 70.60%.

A large population with a fast growth rate and low quality certainly complicates the achievement of development goals and raises the problem of increasing population. The problem of increasing population is a problem experienced by many developing countries, including Indonesia. The large number and rate of population growth that are not matched by good welfare conditions are still a major problem in Indonesia [1].

The Indonesian government to control population growth has established the National Population and Family Planning Agency (BKKBN) which is tasked with improving the quality of life through the development of population control and family planning. One of the programs from the government's efforts is that we know it as family planning or it can be abbreviated as FP. Until now, the public has opened their eyes and followed this program well. Family development aims to improve the quality of the family so that a sense of security, peace, and hope for a better future can arise in realizing physical prosperity and inner happiness [2].

Representatives of the Central Java Province BKKBN as an extension of the Central BKKBN try to answer and respond to various problems that occur with breakthroughs and innovations to carry out family planning population development and family development with the people of Central Java. The ultimate goal to be achieved is the creation of a balanced population growth marked by a decrease in the rate of population growth and the realization of quality families [3].

The Covid-19 pandemic has caused the number of unwanted pregnancies to increase significantly. This is because, during the period of large-scale social restrictions, many health and gynecology clinics

also closed so that people had difficulty getting access to contraceptives. This situation happened because during the Covid-19 pandemic all public and health service activities were limited (only given to those who were urgent to get services) entering health services became scary and finally, everyone avoided doing activities outside the home.

In the execution of Boyolali government proclaimed the acceptors of family planning services to a million and reach targets more than specified. The family planning program in Boyolali Regency is currently managed by the Office of Population Control, Family Planning, Women's Empowerment, and Child Protection (DP2KBP3A), which has been started in 2016.

FP village is an area at the hamlet level or equivalent that has certain criteria where there is an integrated population, family planning and family development program as well as related sectors which are carried out systemically and systematically [4]. Community knowledge and understanding of the FP Village Program is perceived as a program to control the number of children and is identical to contraception/family planning devices, while aspects of population, family development, and cross-sectoral aspects of FP Villages are not well understood [5].

There are 2 FP villages in Cepogo District, Boyolali, one of which is in Kembangkuning Village. Based on an interview with the person in charge of the family planning village in Kembangkuning Village, currently, the most intensified family planning program is male sterilization, this program is socialized and evaluated through the "Prio Utomo" activity which is attended by men of productive age, meetings are held regularly once a month. In achieving the indicators of success in the implementation of the family planning village, the development of innovative activities can be carried out for the welfare of the community, especially creating quality small families. Based on this background, researchers are interested in researching to identify efforts to increase family planning acceptors as an indicator of the success of family planning villages in Kembangkuning Village, Cepogo, Central Java, Indonesia.

METHODS

The method used in this research is the descriptive qualitative research method. Qualitative research methods, explain more on the process of implementing the research itself, not based on the results. Qualitative research is not to generalize, but rather to interpret ideographic understanding. The sampling technique was carried out by purposive sampling, namely by collecting informants with certain considerations, the considerations used in this study were informants who were considered to be the most knowledgeable about the programs in the FP village. In this study, the researcher did not use a population and a sample but instead used a research subject that was by the research focus. The subjects in this study were representatives of family planning acceptors, the leader of the FP village, the village head, and 3 PPKBD representatives in Kembangkuning Village, Cepogo District, Boyolali Regency, Central Java, Indonesia in October 2021. The data used are primary data and secondary data. Data analysis with qualitative techniques using reduction, presentation, and drawing conclusions.

RESULT AND DISCUSSION

The results in this study are divided into three which include: 1) The efforts of contraceptive service providers in increasing male family planning acceptors; 2) Implementation of the village family planning program; 3) Achievements in the success indicators of FP Villages.

The efforts of contraceptive service providers in increasing male family planning acceptors

The number of FP Villages in Boyolali Regency until 2021 is 36 FP Villages and each sub-district has at least 1 FP Village, while for Cepogo Subdistrict there are 2 FB Villages, namely in Jelok Village and Kembangkuning Village. The "Sejahtera" FP village is located in Durensari, Kembangkuning

Village, Cepogo District, Boyolali Regency, Central Java, Indonesia. Kembangkuning Village is currently led by the village head and at the same time as a protector in the structure of the FP Villages working group. This area is famous for its metal crafts, namely copper and aluminum, and has a Sitinggil Flower Park. The population in Durensari Hamlet is 292 people with the composition of the population classified in the table 1:

Table 1. Population Composition by Age

| No | Age (years) | Female | Male |
|-------|-------------|--------|------|
| 1 | 0-4 | 11 | 8 |
| 2 | 5-9 | 15 | 14 |
| 3 | 10-14 | 9 | 10 |
| 4 | 15-19 | 11 | 11 |
| 5 | 20-24 | 7 | 13 |
| 5 | 25-29 | 9 | 11 |
| 6 | 30-34 | 13 | 11 |
| 7 | 35-39 | 14 | 11 |
| 8 | 40-44 | 8 | 10 |
| 9 | 45-49 | 11 | 7 |
| 10 | 50-54 | 11 | 10 |
| 11 | 55-59 | 7 | 8 |
| 12 | 60-64 | 21 | 21 |
| Total | | 147 | 145 |

There are 54 couples of productive age in Durensari Hamlet with 75.9% participation in family planning (41 couples) with the most use of contraceptives are injections (28), Implants (4), IUDs (3), Pills (3) and female sterilization as many as 3, while for the use of male condom contraceptives just a little bit. 13 couples of productive age who did not participate in family planning with the reason that 5 new couples had their first child, 2 couples wanted to have children immediately, 4 couples had no desire to have more children and 2 couples were pregnant.

Currently, most of the family planning acceptors are women with various choices of contraception, while there are still few male family planning acceptors. Based on the results of the interviews, the informants said that;

“Based on my knowledge, women must take family planning or use contraceptives.”

However, in carrying out family planning, both women and men play a role in it so that the task of family planning is not only a woman's job but also a man's job. The results of other studies indicate that family planning issues are not only a concern for women, and in using family planning, permission from the husband is needed so as not to reduce trust between partners. [6].

The use of contraceptives in addition to aiming to regulate pregnancy also has side effects in its use, some side effects arise due to the use of hormonal contraceptives (pills, injections, implants, IUDs) such as decreased sex drive, weight gain, acne, irregular menstrual cycles, brown spots arise from the vagina, pain around the breasts and headaches can even cause cancer. The results of a study conducted in Ghana stated that there are short-term and long-term effects of using family planning, the side effects mentioned include changes in the menstrual cycle (more bleeding, amenorrhea, or oligomenorrhea), infertility, and childbirth complications [7]. the informants said that;

“My wife has been using injectable contraceptives for about 1 year and my wife says that her menstrual cycles are irregular”

The use of contraception in men that is commonly used is single-use condoms, while the use of permanent contraceptives such as vasectomy is still rare. 1) Husbands do not yet know what contraceptive methods are for men; 2) Husbands are afraid of the risks that will be experienced after vasectomy; 3) People's perception of the decline in virility after a vasectomy.

Several other reasons that cause married couples not to do family planning are religious issues, as it is known that Indonesia is a country with a majority Muslim religion and has the assumption that family planning is against religion because it reduces having children, similar research was also found in Southeast Nigeria. the reason not to use family planning either for the wife or husband [8]. The results of another study found that public stigma about vasectomy can follow virility and sex drive also occurs in India [9]. In fact, vasectomy does not cause a decrease in virility, sexual desire and decreased productivity. The informant said that;

"After having a vasectomy 6 months ago, I didn't feel any decrease in sexual desire, I can still have sex without any significant problems, even after the vasectomy I don't worry about pregnancy anymore."

There are several factors in deciding to do or participate in family planning, not only the individual husband/wife factor but also the support from the family planning service provider being the biggest supporting factor. This is because service providers can promote the benefits of family planning and choose contraception according to the condition of the partner, in addition to this service, family planning acceptors can anticipate the occurrence of side effects from the family planning method they use. The informant said that;

"For family planning acceptors who want to do a vasectomy, they get compensation in the form of transportation money to go to a vasectomy service provider, replacement of income within 3 days of rest/not coming to work, and free of charge during the procedure"

In addition to support for compensation, the FP village manager also intensively provides counseling for couples of childbearing age who already have 2 children and no longer want to have children to do family planning. Other support can be in the form of providing counseling services to manage side effects and post-contraception care [10]. With the support from various cross-sectors in FP Villages Sejahtera during 2021, 40 men have had a vasectomy. This has increased because there have been no family planning acceptors who have previously performed vasectomy.

Implementation of the village family planning program

The "Sejahtera" FP Village which was launched on July 4, 2018, has a group of activities including; fostering a family of toddlers (BKB) "TUNAS ENDAH", fostering an elderly family (BKL) "SARI SENJA", fostering a youth family (BKR) "SANDING SIWI", efforts to increase the income of a prosperous family (UPPKS) "ASTA KARYA" and an information and counseling center youth (PIK_R) "IPERSI". Families who actively participate in the activity groups are as follows, for BKB activities as much as 95.24%, BKL activities as much as 70.31%, BKR as much as 50%, UPPKS as much as 21.51%, and PIK-R as much as 33.9%.

The implementation of BKB in FP Villages Sejahtera found that 95.24% of families who had toddlers actively participated in this activity. The informant said that;

"BKB activities are carried out through the toddler integrated healthcare center which is held every month with a series of activities including height measurement and weight weighing, individual counseling based on the results of weighing and health services in the form of providing vitamins, immunizations, and light treatment"

BKL activities in FP Village are 70.31% of families who actively participate, which are carried out at the elderly integrated healthcare center which are routinely carried out every month with activities of measuring and weighing height and weight, recording, simple health services, and providing counseling or counseling on problems experienced by the elderly. *"In this activity, the obstacle that is often faced is the level of activity of the elderly, this is because there are still many productive elderly working when the posyandu is implemented"*.

The implementation of BKR activities in the FP Sejahtera Village, 50 percent of active participating families. BKR has the goal of preparing family life for teenagers through an understanding of the maturation of the age of marriage so that they can carry out education levels in a planned manner; a career in planned work; and marry with full planning according to the reproductive health cycle. *"The implementation of BKR in the FP Sejahtera village is carried out by providing counseling to parents who have teenage children (10-24 years) about education, knowledge about problems in adolescents, and how to overcome them. limited resource persons to fill the activity"*.

The implementation of PIK-R activities in the FP Sejahtera Village, 33.9% of families actively participating. PIK-R activities have the same goals as BKR activities, the difference is that the implementation of BKR activities is carried out on families with teenagers, while for PIK-R activities the approach is carried out directly on the adolescents themselves. *"The level of implementation of PIK-R is still relatively low, besides that there are obstacles in the form of a lack of innovation in the implementation of activities so that few teenagers participate"*.

Implementation of the Business to Increase Prosperous Family Income (UPPKS) in FP Sejahtera Village, 21.51% of families actively participate in this activity, family activity is still relatively low, some of the obstacles encountered during program implementation are *"although Kembangkuning Village is an area that is famous for its metal crafts, both produced individually or in collaboration between several families, but for marketing development, it is still relatively less innovative"*.

Achievements in the success indicators of FP Village

The implementation of the FP Villages program cannot be instant without human resources that support its development. Every activity there must be good coordination between the respective parties involved in the development of the FP Village for the welfare of the community, especially creating quality small families with various programs in the FP Village activities.

Some areas that show the level of effectiveness of the village family planning program include mentioning that the FP Villages program is effective in realizing an independent family, which is marked by the family's understanding of the FP village program, targeting accuracy, and the FP village program for couples of productive age, punctuality, and the Family Planning Village program for Age Couples. Fertility and services for children under five, achieving the goals of the FP Villages Program, and the impact of real changes on couples of productive age [11]. Another study stated that the management's lack of understanding in the development of the FP village led to the ineffectiveness of the FP village program [12]. Several other obstacles can lead to the ineffectiveness of the village family planning program including; limited cadres, limited funds, lack of care coordination, and lack of community participation [13].

The success rate of the FP village in this study was seen from the indicators of the success of the input, process and output [4]. The input indicators are marked by the high participation of all potential villages for the advancement of the family planning village, the variety of activities carried out in an integrated manner, both government programs and community innovation programs, the large source of the family planning village budget obtained from community contributions, government assistance or non-binding donors, and availability facilities and infrastructure. The indicators for the success of inputs in the "Sejahtera" FP Village are the proportional number of PLKB/PKB, the availability of operational support (budget) for the KKBPK program from the APBD and APBN as well as other funding sources such as PNPM, Village Fund Budget (ADD), availability of related medical devices and contraceptives, Jamkesda, and other supporting facilities.

Indicators of the success of the process in achieving family planning villages are determined by the running of activities in each section, the role of government officials in synchronizing activities, the participation of community institutions in managing the family planning village, carrying out 8 family functions in each family, the frequency and quality of counseling activities, the frequency of services for toddler activities. and youth, the frequency of services from other sectors, the frequency of regular meetings of activity groups, and the frequency of activities for the FP village community

movement. In the input indicators for the FP village, it was found that there was an increase in the frequency and quality of outreach activities, an increase in the quality of services for toddlers and youth activities as well as periodic meetings of the BKB, BKR, BKL, UPPKS activity groups.

Meanwhile, the success of the output is measured by the implementation of 8 functions in each family, namely; increasing religious practice, increasing community knowledge and skills, achieving an average of two children per family, healthy families, children growing and developing well, increasing family income per capita and its utilization supporting family interests, protecting society/family and living a peaceful and comfortable life, the more harmonious relationships are established between family members and between the family and the community and the environment, the development of character, manners and cultural arts both in the family and the community in the village, the more harmonious and balanced environment is arranged between behavior and the environment.

Its implementation in the Sejahtera FP village” obtained the following results; There has been no improvement in the implementation of religion, the community already has the skills to increase business, the average family with 2-3 children is achieved, the percentage of family planning participation is increased, health services and counseling are affordable, BKB services are affordable for families with children aged 0-6 years through Posyandu park, affordable health services for the elderly group through the Elderly Posyandu.

It can be concluded that the success rate of FP Villages in the area is classified as good and has a significant positive impact on the residents. Not only measured by the increase in the use of family planning acceptors, the percentage of family activity in participating in group activities is also good, although some activities still need to be increased. Some of the activities that can be used as examples of innovation in the implementation of family development for the elderly such as balance exercises as done in research [14] and in business activities to increase family income by implementing marketing development or the use of appropriate technology as carried out in research [15]. This is the starting point for the opening of family welfare. The effectiveness of the FP Villages program has a significant impact on the welfare of poor families, in other words the more effective the implementation of the FP Villages program, the welfare of the family will increase [16].

CONCLUSION

As an effort to increase family planning acceptors in the Sejahtera FP village, the manager collaborates with various cross-sectors in order to achieve the objectives of implementing the FP village program as an emphasis on population growth and the development of a prosperous family. The participation of families and communities in every activity shows the effectiveness of the implementation of the FP village program, besides the support from various cross-sectors in the implementation of the program is an indicator of the success of the KB village. It is hoped that with the achievement of indicators of the success of the program, family welfare will increase.

AUTHORS' CONTRIBUTIONS

Conception and design (S, DAAT), Definition of intellectual content (S), Literature search , clinical and experimental studies (S, DAAT), data acquisition and analysis (S, DAAT)), statistical analysis (S), preparation and editing manuscript (DAAT), review of the manuscript (S), and guarantor (S).

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Analisis Biomekanik Kinetik pada Atlet *Badminton* dengan Nyeri Lutut Saat Gerakan *Backhand Diagonal Forward Lunges*

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ABSTRAK

Badminton merupakan olahraga raket yang populer di seluruh dunia, olahraga ini memiliki karakteristik gerakan eksplosif dan intensif, salah satunya adalah gerakannya *backhand diagonal forward lunges* yang mana bukan hanya otot ekstremitas bawah yang teraktivasi namun sangat dipengaruhi oleh aktivasi pada ekstremitas atas. Analisis biomekanik kinetik merupakan salah satu kajian ilmu biomekanik yang membahas mengenai gaya yang terjadi di dalam tubuh yaitu aktivasi otot. Angka kejadian cedera olahraga ini lebih sedikit dibanding olahraga lain, namun tingkat keparahannya tinggi, salah satu cedera yang paling sering muncul adalah cedera lutut. Nyeri lutut dapat menyebabkan penurunan fungsi dan fisik seorang atlet. Tujuan dari penelitian ini untuk melihat apakah terdapat hubungan antara kualitas nyeri lutut (diukur menggunakan KOOS) dengan aktivasi otot (diukur menggunakan *surface EMG*) serta untuk mengetahui apakah terdapat pengaruh riwayat cedera multiregional terhadap aktivasi *m.vastus medialis oblique*, *m.vastus lateralis*, *m.biceps femoris* dan *m.erector spine* saat gerakan *backhand diagonal forward lunges*. Jenis penelitian ini adalah kuantitatif melalui pendekatan korelasional dengan desain *crosssectional study*. Jumlah sampel dalam penelitian ini adalah 21 atlet yang masuk kedalam kriteria inklusi. Hasil uji normalitas diukur menggunakan *Shapiro wilk* didapatkan hasil $p : 0.064 > 0.05$. Hasil uji korelasi menggunakan *pearson correlation*, terdapat hubungan yang kuat antara kualitas nyeri lutut dengan aktivasi otot. Hasil uji beda menggunakan *independent sample t-test* yaitu terdapat pengaruh riwayat cedera multiregional terhadap aktivasi pada *m.erector spine* $p (0.04 < 0.05)$.

Kata Kunci : Badminton, *Lunges*, Nyeri Lutut, Aktivasi otot

PENDAHULUAN

Badminton merupakan salah satu jenis olahraga raket yang populer dan dapat dimainkan siapa saja tanpa memandang jenis kelamin, usia, maupun level keahlian (Lam *et al.*, 2018). Angka kejadian cedera pada *badminton* cenderung lebih sedikit dibandingkan dengan olahraga lainnya (Phomsoupha & Laffaye, 2020), namun tingkat keparahannya cenderung lebih tinggi (Marchena-Rodriguez *et al.*, 2020). Hal ini dibuktikan oleh Lindblad (1994) bahwa 56% atlet badminton yang mengalami cedera akan berhenti bermain akibat dari cedera yang ia alami. Selain itu Park *et al.*, (2017) menyebutkan bahwa *knee* merupakan regio yang paling sering mengalami cedera, ini terjadi dikarenakan karakteristik permainannya yaitu gerakan berulang dan intensitas tinggi sehingga beban yang diterima pada lutut meningkat. Nyeri lutut merupakan penyebab terjadinya penurunan fungsi dan fisik seorang atlet (Huang *et al.*, 2014). Pernyataan ini didukung oleh Farrokhi *et al.* (2008) bahwa nyeri lutut menyebabkan perubahan pola aktivasi otot pada *knee* dan *trunk* saat gerakan *backhand diagonal lunges*, perubahan pola aktivasi akan menimbulkan perbedaan kekuatan otot sehingga meningkatkan resiko cedera pada lutut (Devlin, 2000). Pola aktivasi otot merupakan kajian dari ilmu biomekanik khususnya kajian analisis kinetik

Salah satu teknik dasar dalam olahraga *badminton* adalah *footwork* (Valdecabres *et al.*, 2020). Gerakan *footwork* memiliki frekuensi yang paling banyak ditemukan selama pertandingan. Salah satu gerakan *footwork* yang sering dilakukan dalam permainan ini adalah *lunges*, menurut (Kuntze *et al.*, 2010) menyatakan bahwa 15% gerakan dalam permainan *badminton* dapat dikategorikan sebagai gerakan *lunges*, gerakan ini merupakan sebuah gerakan yang kompleks karena otot yang teraktivasi bukan hanya pada ekstremitas bawah namun sangat dipengaruhi oleh ekstremitas atas salah satunya adalah *trunk* yang berfungsi untuk menjaga keseimbangan selama gerakan (Farrokhi *et al.*, 2008). Gerakan *backhand diagonal forward lunges* adalah salah satu gerakan *lunges* yang membutuhkan rotasi

trunk yang tinggi apabila dibandingkan *forehand diagonal lunges* sehingga *neuromuscular control* jauh lebih aktif. Saat gerakan *backhand diagonal forward lunges* otot ekstremitas bawah yang teraktivasi antara lain *m.vastus medialis oblique*, *m.vastus lateralis*, *m.biceps femoris* dan otot pada *trunk* yang teraktivasi salah satunya adalah *m.erector spine*.

Analisis biomekanik kinetik merupakan kajian mendalam terkait gaya yang terjadi di dalam tubuh, yaitu gaya yang dihasilkan oleh otot atau disebut dengan pola aktivasi otot (Yin *et al.*, 2015). Analisis yang dimaksudkan dalam penelitian ini terkait kajian mendalam mengenai hubungan antara nyeri lutut dengan pola aktivasi otot *knee* dan *trunk* pada pemain *badminton* saat gerakan *backhand diagonal forward lunges*. Pengukuran nyeri lutut menggunakan KOOS (*The Knee injury and Osteoarthritis Outcome Score*) yang merupakan sebuah instrument pengukuran untuk menilai pendapat pasien terkait masalah pada lututnya (Roos & Lohmander, 2003) sedangkan aktivasi otot diukur menggunakan *Electromyograph* yang merupakan sebuah teknologi untuk merekam aktivitas listrik yang berasal dari otot (Mills, 2005).

Pada penelitian ini penulis juga menganalisis terkait pengaruh riwayat cedera multiregional terhadap pola aktivasi otot pada *knee* dan *trunk* saat gerakan *backhand diagonal forward lunges*, hal ini didasari pada penelitian yang sebelumnya oleh Kester *et al.* (2017) menyebutkan bahwa 80 % individu yang telah mengalami cedera lutut dapat kembali berolahraga. Hipotesa penulis menyatakan bahwa terdapat faktor lain yang mempengaruhi kemampuan atlet dalam bermain salah satunya adalah cedera multiregional, sehingga penulis melakukan *study* komparasi antara atlet yang mengeluhkan nyeri lutut saja dengan atlet yang mengeluhkan nyeri lutut dan cedera multiregional.

METODE

Jenis penelitian ini adalah penelitian kuantitatif melalui pendekatan korelasional dengan desain *cross sectional study*. Pada penelitian ini membahas mengenai analisis biomekanik kinetik terkait hubungan antara nyeri lutut dengan pola aktivasi otot *knee* dan *trunk* serta pengaruh riwayat cedera multiregional terhadap pola aktivasi otot *knee* dan *trunk* pada atlet *badminton* saat gerakan *backhand diagonal lunges*.

Penelitian ini dilakukan setelah mendapat perizinan dengan diterbitkannya *ethical clearance* No.312/B.2/KEPK-FKUMS/I/2021. Populasi dalam penelitian ini adalah seluruh atlet *badminton* dari Klub Persatuan Masyarakat Solo (PMS) yang berjumlah 37 atlet dan untuk sampel yang masuk dalam kriteria inklusi dan eksklusi berjumlah 21 atlet, adapun kriteria inklusi : 1) bersedia berpartisipasi menjadi sampel dalam penelitian ini dengan mengisi *informed consent*. 2) merupakan atlet *badminton* remaja yang berusia 14-18 tahun. 3) memiliki pengalaman bermain selama >2 tahun. 4) mengeluhkan nyeri lutut pada *dominant racket hand*. Kriteria eksklusi adalah atlet sedang menjalani program latihan setelah mengalami cedera. Variabel bebas dalam penelitian ini adalah nyeri lutut pada *dominant racket hand* sedangkan variabel terikat dalam penelitian ini adalah aktivasi otot pada saat melakukan gerakan *backhand diagonal forward lunges* serta terdapat variabel pengganggu dalam penelitian ini yaitu riwayat cedera multiregional.

Pengambilan data dimulai dengan datang ke klub badminton Perkumpulan Masyarakat Solo (PMS) pada bulan Desember 2020. Alur dilakukannya penelitian diantara lain : (1) Pengisian data diri dan lembar KOOS. (2) Responden melakukan warming up. (3) Persiapan alat EMG dan pemasangan elektroda pada otot *m.vastus medialis oblique*, *m.biceps femoris*, *m.vastus lateralis*, dan *m.erector spine*. (4) Posisi *static standing* dihitung sebagai posisi netral. (5) responden mulai melakukan gerakan *backhand diagonal forward lunges* dengan cara maju ke depan sebanyak 2 langkah pada *non dominant lower extremity* lalu menumpukan tubuh pada *dominant lower extremity* dengan gerakan tangan *backhand*, gerakan ini membutuhkan waktu kurang lebih 3 detik, posisi yang diukur dalam penelitian ini adalah posisi statik atau *fix position* saat *backhand diagonal forward lunges*. (6) Pengukuran dilakukan sebanyak tiga kali pengulangan gerakan, pengambilan data adalah diambil rata rata dari ketiganya.

HASIL

Tabel 1. Karakteristik Responden

| Karakteristik | frekuensi | (%) | Mean | P |
|----------------------|-----------|------|---------|------|
| Jenis Kelamin | | | 1.4286 | 1.00 |
| Laki-laki | 12 | 57.1 | | |
| Perempuan | 9 | 42.9 | | |
| Umur | | | 15.4768 | 1.00 |
| 14 tahun | 7 | 33.3 | | |
| 15 tahun | 5 | 23.8 | | |
| 16 tahun | 2 | 9.5 | | |
| 17 tahun | 6 | 28.6 | | |
| 18 tahun | 1 | 4.8 | | |
| Dominan raket | | | 1.1429 | 1.00 |
| Kanan | 18 | 85.7 | | |
| Kiri | 3 | 14.3 | | |
| Cedera | | | 1.5238 | 1.00 |
| Nyeri lutut | 10 | 47.6 | | |
| Multiregional | 11 | 52.4 | | |

Sumber: Data Primer, 2021

Dari tabel 1 tersebut dapat diketahui bahwa total responden adalah 21 atlet dengan 12 laki laki dan 9 perempuan dan rentan usia 12-18 tahun. Atlet lebih banyak menggunakan tangan kanan dengan total 18 atlet sedangkan dominan raket kiri berjumlah 3 atlet. Karakteristik terakhir adalah berdasarkan cedera, atlet yang mengeluhkan nyeri lutut saja berjumlah 10 orang (47.6 %) sedangkan atlet yang mengeluhkan nyeri lutut dan memiliki riwayat cedera multiregional sebanyak 11 orang (52.4 %). Penyebab dari nyeri lutut yang masuk kedalam karakteristik responden beragam diantaranya karena *ACL tear*, *meniscus tear*, *jumper's knee*, dan *pattellofemoral pain*. Sedangkan untuk cedera multiregional dilihat berdasarkan *history injury* diantaranya adalah *back pain*, *shoulder pain*, *epicondylitis*, dan *groin pain*.

Tabel 2. Uji normalitas KOOS dan *muscle activation*

| No | Nama otot | Nilai sig | Jumlah | Keterangan |
|----|-----------------------------------|-----------|--------|--------------|
| 1 | KOOS | 0.064 | 21 | Normal |
| 2 | <i>m. vastus medialis oblique</i> | 0.000 | 21 | Tidak normal |
| 3 | <i>m.vastus lateralis</i> | 0.140 | 21 | Normal |
| 4 | <i>m.biceps femoris</i> | 0.048 | 21 | Tidak normal |
| 5 | <i>m. erector spinae</i> | 0.030 | 21 | Tidak normal |

Uji normalitas yang digunakan adalah *shapiro wilk test* karena responden <50, uji *shapiro wilk* memiliki nilai sig > 0.05. Pada data hasil KOOS didapatkan nilai sig 0.064 yang artinya data berdistribusi normal. Maka untuk uji korelasi menggunakan *pearson correlation* serta untuk uji beda menggunakan *independent sample t test*.

Tabel 3 Uji Korelasi

| No | Otot | Nilai sig | (r) | Korelasi | Ket |
|----|------------|-----------|-----------|-------------|-----|
| 1 | <i>VMO</i> | 0.00 | - 0.834** | Sangat kuat | - |
| 2 | <i>VL</i> | 0.00 | 0.933** | Sangat kuat | + |
| 3 | <i>BF</i> | 0.00 | 0.874** | Sangat kuat | + |
| 4 | <i>ES</i> | 0.00 | - 0.709** | Kuat | - |

Dari tabel diatas merupakan hasil uji korelasi dengan *pearson correlation* dengan nilai sig <0.05 adapun hasilnya adalah terdapat hubungan yang signifikan antara nilai KOOS dengan aktivasi otot. Untuk arah dan kekuatan hubungan dapat dilihat dari nilai r yaitu terdapat hubungan negatif atau berlawanan antara nilai KOOS dengan aktivasi *m.vastus medialis oblique* yaitu -0.834** dan *m.erector spine* yaitu -0.709**. Hubungan negatif atau berlawanan menjelaskan bahwa ketika terjadi penurunan nilai KOOS maka sebaliknya akan terjadi peningkatan level aktivasi pada kedua otot tersebut. Selain itu juga terdapat hubungan positif antara nyeri lutut dengan *m.vastus lateralis* yaitu 0.93** dan *m. biceps femoris* yaitu 0.874**, hubungan searah atau positif menjelaskan bahwa ketika terjadi peningkatan nilai KOOS maka terjadi pula peningkatan level aktivasi pada kedua otot tersebut. Nilai KOOS terdiri dari 0-100 dengan nilai lebih rendah menunjukkan bahwa kemampuan fungsional menurun atau bisa diartikan kualitas nyeri mengalami peningkatan.

Tabel 4 Uji beda nyeri lutut dengan nyeri lutut dan cedera multiregional

| No | Muscle | sig (p) | Keterangan |
|----|------------|---------|--|
| 1. | <i>VMO</i> | 0.450 | Tidak terdapat perbedaan yang signifikan |
| 2. | <i>VL</i> | 0.330 | Tidak terdapat perbedaan yang signifikan |
| 3. | <i>BF</i> | 0.168 | Tidak terdapat perbedaan yang signifikan |
| 4. | <i>ES</i> | 0.040 | Terdapat perbedaan yang signifikan |

Dari tabel 4 diatas merupakan uji beda yang dilakukan menggunakan uji beda *independen sampel t-test* dengan nilai sig < 0.05, uji beda ini dilakukan untuk melihat apakah terdapat perbedaan antara dua grup yaitu grup A: atlet yang mengeluhkan nyeri lutut saja (n=10) dan grup B yaitu atlet yang mengeluhkan nyeri lutut dan cedera multiregional (n=11). Didapatkan hasil pada *m.vastus medialis oblique* (0.45), *m.vastus lateralis* (0.33), dan *m.biceps femoris* (0.168) yang artinya tidak terdapat perbedaan yang signifikan antar kedua grup, namun pada *m.erector spine* menunjukkan hasil terdapat perbedaan yang signifikan sebesar 0.04, artinya riwayat cedera multiregional mempengaruhi aktivasi dari *m.erector spine*.

PEMBAHASAN

Hubungan antara nyeri lutut dengan aktivasi otot

Dari penelitian yang dilakukan pada 21 atlet *badminton* saat gerakan *backhand diagonal forward lunges* secara menyeluruh didapatkan hasil bahwa terdapat hubungan yang kuat antara kualitas nyeri lutut dengan aktivasi otot. Hubungan ini terjadi karena beberapa faktor, salah satunya secara anatomis sendi lutut memiliki stabilitas yang lebih rendah jika dibandingkan dengan sendi lainnya seperti *shoulder* yang memiliki *cavitas glenoidale* dan *caput humeri*, sendi *hip* yang memiliki *acetabulum* dan *caput femur* yang secara structural sangat stabil (Moura & Fonseca, 2018). Pada sendi lutut stabilitasnya sangat bergantung pada jaringan lunak disekitarnya seperti *ligament, meniscus, bursa, tendon* dan otot sehingga ketika terjadi cedera lutut menimbulkan perubahan pada sistem neuromuskuler salah satunya adalah perubahan aktivasi otot (Niccoli *et al.*, 2017). Selain karena faktor di atas penulis menemukan bahwa populasi yang digunakan memiliki tingkat homogenitas tinggi karena atlet sendiri memiliki program latihan yang hampir sama, penggunaan alat ukur yang tepat

dari segi validitas, reliabilitas ataupun ICF domain juga menjadi faktor penting yang menyebabkan hubungan antar dua variabel. Penggunaan SENIAM dalam protokol pemasangan elektroda juga meningkatkan level sensitivitas dari pengukuran aktivasi otot (Hermens *et al.*, 1999). Selain itu penggunaan instrument KOOS dinilai tepat untuk mengukur kemampuan fungsional lutut seseorang (Roos & Lohmander, 2003) walaupun instrument ini sudah diterjemahkan dalam banyak bahasa, namun KOOS sendiri belum dilakukan uji kultural di Indonesia (Collins *et al.*, 2016). Interpretasi instrument KOOS dengan rentan nilai 0-100 dimana semakin rendah nilai KOOS menunjukkan kemampuan fungsionalnya menurun atau menunjukkan tingginya level nyeri yang dirasakan atlet tersebut (Roos & Lohmander, 2003). Dari data hasil *electromyography* menjelaskan bahwa ketika terjadi peningkatan nilai KOOS akan terjadi pula peningkatan aktivasi *m.vastus medialis oblique* dan *m.erector spine* namun terjadi penurunan aktivasi pada *m.biceps femoris* dan *m.vastus lateralis*. Hal ini terjadi karena secara umum saat atlet melakukan gerakan *lunges* *m.vastus medialis oblique* akan berkontraksi eksentrik sedangkan *m.biceps femoris* berkontraksi kosentrik, ini disebut dengan mekanisme *co-activation* (Riemann *et al.*, 2012). Ketika terjadi peningkatan nyeri *m.vastus medialis oblique* akan meningkat aktivasinya untuk menjaga stabilitas sendi lutut sedangkan *m.vastus lateralis* dan *m.biceps femoris* akan menurunkan aktivasinya sebagai strategi kompensasi agar tidak menimbulkan cedera lain yang lebih parah (Zhao & Li, 2019). Disisi lain nyeri lutut dapat menyebabkan perubahan pada H:Q rasio (*hamstring: quadriceps* rasio) yang mana ketika terjadi peningkatan nyeri, aktivasi *mm.quadriceps* meningkat dan *mm.hamstring* menurun, ketika *mm.hamstring* mengalami penurunan aktivasi akan menimbulkan tingginya faktor cedera lainnya seperti *hamstring strain* (Chester *et al.*, 2008). Data hasil penelitian menyebutkan bahwa terjadi peningkatan aktivasi *m.erector spine* pada area kontralateral ketika nyeri lutut meningkat. Hal ini terjadi karena pada saat gerakan *backhand diagonal forward lunges* akan terjadi mekanisme *diagonal line* antara *m.erector spine* dan *m.biceps femoris*. Walaupun *m.vastus medialis oblique* dan *m.vastus lateralis* merupakan *one joint muscle*, namun pada *m.biceps femoris* bersifat *two joint muscle* yang berorigo di *pelvic*, sedangkan *m.erector spine* juga terletak pada *pelvic* (Wingerden *et al.*, 1993). Untuk itu atlet perlu diberikan *muscle strengthening* pada daerah *ipsilateral* dan *muscle release* pada daerah kontralateral dari *m.erector spine* (Huxel Bliven & Anderson, 2013). Penelitian sebelumnya menyebutkan bahwa kombinasi *knee exercise* dan *core muscle strengthening* dapat menurunkan level nyeri pada lutut (Ferber *et al.*, 2015), latihan ini juga bermanfaat sebagai *injury prevention training* untuk mencegah cedera pada lutut (Huxel Bliven & Anderson, 2013).

Pengaruh riwayat cedera multiregional terhadap aktivasi otot

Dari hasil uji beda didapatkan bahwa tidak dapat perbedaan yang signifikan antara aktivasi otot *m.vastus medialis oblique*, *m.vastus lateralis*, *m.biceps femoris* pada atlet yang mengeluhkan nyeri lutut saja dengan atlet yang mengalami nyeri lutut dan cedera multiregional. Namun pada aktivasi *m.erector spine* terdapat pengaruh yang signifikan, hal ini karena secara anatomis *trunk* akan berhubungan langsung dengan ekstremitas atas yaitu *shoulder complex* dan ekstremitas bawah yaitu pelvis sehingga kondisi cedera pada bagian lain sangat mempengaruhi level aktivasi pada *m.erector spine* (Farrokhi *et al.*, 2008).

KESIMPULAN

Terdapat hubungan yang kuat antara kualitas nyeri lutut dengan aktivasi otot pada regio *knee* dan *trunk*, ketika terjadi peningkatan nyeri maka terjadi peningkatan pada *m.vastus medialis oblique* & *m.erector spine* dan sebaliknya terjadi penurunan pada *m.biceps femoris* dan *m.vstus lateralis*.

Tidak terdapat pengaruh dari riwayat cedera multiregional terhadap aktivasi pada *m.vastus medialis*, *m.vastus lateralis*, dan *m.biceps femoris*, namun riwayat cedera multiregional mempengaruhi aktivasi pada *m.erector spine*.

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Analysis of The Disclosure Rate of Local Government Financial Statements in Indonesia

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ABSTRACT

Purpose: One of the criteria for giving an opinion by an examiner according to Act No. 15/2004 is the adequacy of the disclosure rate. Previous research has only examined the disclosure rate partially and has not used data for the 2018 fiscal year. This study aims to analyze the disclosure rate of Local Government Financial Statement (LKPD) for the 2018 fiscal year in Indonesia.

Methodology: This study uses a descriptive quantitative approach. The instrument in this study refers to Government Accounting Standards (SAP) based on Government Regulation No. 71/2010 as many as fifteen mandatory criteria consisting of sixty nine sub criteria. The data used in this study is secondary data in the form of Provincial/District/City LKPDs for the 2018 fiscal year as many as 542 LKPDs with saturation sampling technique.

Results: The results showed that the level of disclosure in Indonesia is still low at 48.22% with the highest level of disclosure of 65.22% and the lowest level of disclosure of 30.43%. From the analysis of the difference test, it was found that there were differences in disclosure between LKPDs that received unqualified opinions and qualified opinions, there were differences in disclosures between LKPDs that received unqualified opinions and disclaimer of opinions, but there was no difference in disclosure between LKPDs that received qualified opinions and disclaimer of opinions.

INTRODUCTION

International Standard on Auditing (ISA) 700 and 705 states that one of the criteria for the formulation of opinions on financial statements is the adequacy of disclosure. In the public sector audit in Indonesia, the Government has issued Act No. 15/2004 on Examination of State Financial Management and Responsibility. Act No. 15/2004 in the explanation of article 16 paragraph (1), opinion is a professional statement of the examiner regarding the fairness of financial information presented in financial statements that is based on criteria in accordance with government accounting standards, adequate disclosures, compliance with laws and regulations, and the effectiveness of internal control systems. According to Act No. 15/2004 there are four types of opinions that can be given by the examiner, namely unqualified opinion, qualified opinion, adverse opinion, and disclaimer of opinion.

One of the criteria for giving opinions on the explanation of article 16 paragraph (1) of Act No. 15/2004 is the adequacy of disclosure. Accounting standards require examiners to use the basis of disclosure of sufficient information in the provision of opinions. Disclosure of insufficient information in financial statements as stipulated in Government Accounting Standards (SAP) then the examiner can consider the materiality impact of information that is not adequately disclosed (BPK, 2012). Therefore, the auditor must modify his opinion if he finds disclosure of LKPD that is not in accordance with Government Accounting Standards (SAP) (Igbal, 2018).

The Government of the Republic of Indonesia in 2010 has issued Government Regulation No. 71 on Government Accounting Standards. Based on Government Regulation No. 71/2010 paragraph 53 explains that financial statements present in full the information needed by users. Information required by users of financial statements may be placed on the financial statement advance sheet or Notes on Financial Statements (CaLK). The report includes information about accounting policies used by reporting entities and other information required and recommended to be disclosed in

Government Accounting Standards (SAP) as well as expressions necessary to produce a reasonable presentation of financial statements. The presentation of Notes on Financial Statements (CaLK) has an important role to help users of financial statements so as not to misperception by increasing the transparency of financial statements and providing a better understanding of government financial information.

Government Regulation No. 71/2010 states that CaLK is presented systematically. The advance sheet referred to in the conceptual framework of paragraph 53, Government Regulation No. 71/2010 is the Statement of Budget Realization (LRA), Accumulated Budget Surplus Change Report (LPSAL), Balance Sheet, Operational Report (LO), Cash Flow Statement (LAK) and Equity Change Statement (LPE). Each post in the LRA, LPSAL, Neraca, LO, LAK and LPE must have a cross-reference with the relevant information within the CaLK. An explanation or analysis of the value of the posts presented in LRA, LPSAL, Neraca, LO, LAK and LPE is contained in CaLK.

Article 16 paragraph (1) of Act No. 15/2004 is clarified by Government Regulation No. 71/2010 in the conceptual framework of paragraphs 53 and 83 outlining that the adequacy of disclosure contains about the complete information that should be explained in the financial statements and the location of the information that should be presented because of the importance of complete information for users of the Local Government Financial Statement (LKPD). Disclosure of adequate local government financial statements is expected to really be a matter of consideration, especially for bpk auditors as one of the conditions in the provision of opinions. Through this research can be known the difference in financial statement disclosure between local governments who get unqualified opinion (WTP) and opinions other than WTP.

Summary of The Results of The First Semester Examination (IHPS) in 2019 of the Audit Board of the Republic of Indonesia (BPK RI) mentioned that BPK RI has examined as many as 542 (100%) Local Government Financial Statements (LKPD) in 2018. From the results of BPK RI examination of 542 LKPD in 2018, as many as 443 (82%) LKPD obtained unqualified opinion (WTP), as many as 86 (16%) LKPD obtained qualified opinion (WDP), and as many as 13 (2%) LKPD obtained disclaimer of opinion (TMP). When compared to BPK RI examination in 2017, the quality of LKPD in 2018 increased as indicated by an increase in unqualified opinion (WTP) of 6% which is 411 (76%) LKPD in 2017 to 443 (82%) LKPD in 2018. Based on the Government level, WTP opinion was reached by 32 out of 34 Provincial Governments (94%), 327 out of 415 District Governments (79%), and 84 out of 93 Municipal Governments (90%). The achievement of this opinion has exceeded the regional financial performance targets in the Field of Strengthening Local Government Governance or the Financial Capacity Building Program of Provincial, Regency, and City Governments set in RPJMN 2015-2019 by 85% (province), 60% (regency), and 65% (city) respectively in 2019.

Data on the success of local governments both provincial government, regency government and city government received WTP opinion inversely proportional to a number of previous studies on the level of disclosure of Local Government Financial Statements in Indonesia so that an interesting phenomenon appeared. Iqbal's research (2018) which aims to assess the disclosure rate of Local Government Financial Statements (LKPD) from 2013 to 2014 that obtained unqualified opinion (WTP) obtained the result that the average mandatory disclosure rate of LKPD is low value, which is 53.79% in 2013 and 56.14% in 2014. Suwarjuwono (2017) examined the level of inventory account disclosure in the Local Government Financial Statement (LKPD) in Java in 2014 obtained the results of the level of disclosure of inventory accounts in LKPD in Java is still low (by 40.35%) and not in accordance with SAP. The study also found that there was no difference in inventory account disclosure with WTP, WDP, and TMP opinions. Putri (2019) conducted research on the analysis of factors that affect the mandatory disclosure rate of Local Government Financial Statements in West Sumatra in 2015-2017, the average result of mandatory disclosure rate is still low by 61%. The results of these studies show that LKPD still does not contain enough disclosure.

Based on the background of the above problems it can be concluded that previous research only examined the level of partial disclosure or part of one of the accounts in the balance sheet, there has

been no research on the overall disclosure rate in accordance with the criteria in SAP with provincial/regency/city LKPD data throughout Indonesia that uses the latest LKPD data in 2018, then the formulation of the problem that will be examined is (1) is the level of disclosure of Local Government Financial Statements (LKPD) in Indonesia fiscal year 2018 in accordance with the disclosure criteria in SAP?, (2) Is there a difference in the level of disclosure of Local Government Financial Statements (LKPD) in Indonesia fiscal year 2018 based on the Opinion of BPK Assessment Report (LHP BPK)?

The purpose of this study is to (1) analyze the level of disclosure in the Local Government Financial Statements (LKPD) in Indonesia Fiscal Year 2018 in accordance with the disclosure criteria in SAP, (2) know the difference in the level of disclosure in the Local Government Financial Statements (LKPD) in Indonesia Fiscal Year 2018 with the opinion of WTP, WDP and TMP. The adequacy of disclosure in a broad sense (both mandatory disclosure and voluntary disclosure) has been extensively researched by researchers before. Researchers are interested in thoroughly analyzing the level of disclosure of Local Government Financial Statements according to the disclosure criteria on PSAP (PP. No 71/2010).

THEORETICAL FRAMEWORK

Agency Theory

Agency problems can occur in all organizations, both private and public organizations (Zimmerman, 1977). In public organizations or government sectors, agency problems occur between government officials (principals) and voters (people) as agents. Government officials as parties who organize public services have more information so that it is possible to make decisions or policies that only attach importance to the government and the ruler and override the interests and welfare of the people. To reduce the problem, the efforts that must be done by local governments are to present financial statements in a transparent and accountable manner in order to gain the trust of the community.

Signalling Theory

Evans and Patton (1987) stated that in the context of Signalling Theory, the Government seeks to give a good signal to the public. Therefore, the public can continue to support the activities of the current government. In order for Local Government Financial Statements to be understood, all those related to financial statements must have clear disclosure. Disclosure of financial statements is explained in CaLK which is one component of the Local Government Financial Statement. These disclosures certainly pave the way for the public to see the transparency of efforts made by local governments.

Legitimacy Theory

According to O'Donovan (2002), the theory of legitimacy is based on the idea that an organization to continue its operations must act within the limits of behavior acceptable to the social environment. The organization will create alignment of all its activities with the social norms of the society in which the organization is located. As long as the organization's work programs and activities are aligned, the organization's existence and activities can be authorized.

Financial Statements

Financial statements are used to determine the value of economic resources utilized in carrying out government operations, assess financial conditions, assess the effectiveness and efficiency of a reporting entity, and help determine compliance with laws and regulations (Republic of Indonesia, 2010).

While the purpose of reporting determines the relevant concepts and principles that ultimately determine the form, content, type, and arrangement of financial statements, the intended party and

its interests must be clearly identified so that the information generated by financial reporting can satisfy the informational needs of the intended party (Suwardjono, 2014).

One of the main components of financial statements is CaLK which includes details of the numbers listed in the LRA, LPSAL, LO, LPE, Balance Sheet and LAK. CaLK also includes information about accounting policies used by reporting entities and other information required and recommended to be disclosed in SAP as well as expressions necessary to produce a reasonable presentation of financial statements. CaLK presents the following: (a) discloses general information about reporting entities and accounting entities, (b) presents information on fiscal or financial and macroeconomic policies, (c) presents an overview of the achievement of financial targets during the reporting year following the constraints and obstacles faced in achieving the target, (d) presents information on the basis for the preparation of financial statements and accounting policies selected to be applied to transactions and other events, (e) presents the details and explanations of each post presented on the front sheet of the financial statements, (f) disclose information required by the Government Accounting Standards Statement (PSAP) that has not been presented in the front sheet of the financial statements, (g) provide other information necessary for reasonable presentation, which is not presented in the front sheet of the financial statements.

Audit of Financial Statements

In Act No. 15 of 2004 it is mentioned that the audit of the management and financial responsibility of the state is carried out by the Audit Board (BPK). One type of audit that is routinely conducted every year by the BPK is an audit of LKPD (Republic of Indonesia, 2005). Act No. 17/2003 on state finances and Act No. 32/2004 states that it has not been submitted to the DPRD, LKPD must first be examined by the BPK. An audit of LKPD conducted by BPK will result in an opinion on LKPD. The results of the audit will provide confidence in the conformity of the presentation of LKPD with SAP and applicable laws and regulations.

There are four types of opinions that can be given by the examiner, namely unqualified opinion, qualified opinion, adverse opinion, and disclaimer of opinion. One of the criteria in giving an opinion is the ability of disclosure. In technical bulletin number 01, reporting the results of the examination of government financial statements mentioned that sufficient disclosure is a condition that reflects that the financial statements and their records have provided information that can affect the use, understanding and interpretation of financial information adequately in accordance with government accounting standards (Republic of Indonesia, 2012). The provision to consider disclosures included in the formulation of audit opinions on government financial statements has been contained in government accounting regulations and standards (SAP). Act No. 15/2004 and technical bulletin number 01 states that the adequacy of disclosure is one of the criteria that must be used as a reference by auditors in formulating opinions on government financial statements. The auditor should assess the adequacy of the disclosure of government financial statements and make the results of his assessment as one of the considerations in formulating audit opinions (Republic of Indonesia, 2012).

Disclosure of Local Government Financial Statements

Disclosure consists of mandatory and voluntary disclosure (Suwardjono, 2005). Mandatory disclosure is disclosure required by accounting standards of regulatory agency regulations, while voluntary disclosure is disclosure beyond that required.

Suwardjono (2005) mentions that the breadth and detailing of disclosures related to how much information should be disclosed called the level of disclosure .

Previous Research

Suwarjuwono and Ritonga (2017) examined the disclosure of inventory accounts in the Local Government Financial Statements in Java. The method used in the selection of samples is purposive sampling and obtained a sample of 113 LKPD districts/cities in Java in 2014. While the data analysis

method uses percentage descriptive techniques and obtained the result that there is no LKPD regency/city in Java in 2014 that has a inventory disclosure rate of 100%. The level of disclosure of inventory accounts in LKPD Regency/City in Java in 2014 was only 40,35%.

Iqbal, Gudono and Ritonga (2018) researched about the adequacy of disclosures have been considered by the audit board (BPK) in the formulation of opinions. The data used in this study are primary and secondary data. Primary data from data collection and interviews, while secondary data from BPK examination report data in 2013 and 2014. The sampling method used in this study was convenience sampling. From the sampling obtained 42 LKPD throughout Indonesia in 2013 and 2014. Data analysis methods use case study techniques supported by LKPD mandatory disclosure rate measurement data. The results of the LKPD disclosure rate measurement showed that the average LKPD disclosures in 2013 and 2014 were 53,79% and 56,14%.

Putri and Arza (2019) examined the factors that influence the mandatory disclosure rate of local government financial statements. Purposive sampling technique is used by researchers in determining the method of selection of samples so that 57 LKPD districts/cities in West Sumatra in 2015-2017. The study used hypothesis testing based on multiple regression analysis. The results showed that the mandatory disclosure rate of local government financial statements was 39,9%.

The limitations of Suwarjuwono's research (2017) only focus on the adequacy of disclosure rate of inventory accounts in LKPD in Java. The results of this study cannot be generalized on all LKPD accounts in Indonesia. Iqbal's research (2018) is limited to the assessment of mandatory disclosure levels of LKPD who obtained unqualified opinion (WTP) opinions with LKPD who obtained opinions other than unqualified opinion (WTP) in 2013 and 2014. While the Putri research (2019) assessed mandatory disclosure factors in regencies/cities of West Sumatra Province only in 2015-2017. This study is different from previous studies. Researchers conducted a thorough disclosure level study according to the criteria in SAP in the Provincial/Regency/City LKPD as many as 15 criteria with 69 sub criteria. Research data also uses LKPD throughout Indonesia, so research is expected to reveal the actual conditions. LKPD data also uses Fiscal Year 2018 data that has never been used in previous studies.

Research Hypothesis

Unqualified Opinion (WTP) with Qualified Opinion (WDP)

Disclosure in accordance with SAP criteria in Government Regulation No. 71/2010 has been implemented thoroughly in the territory of Indonesia since 2015. LKPD from 2015 of course continues to experience improvements in terms of disclosure quantity and in terms of quality. BPK auditors from year to year also provide recommendations for LKPD improvement through BPK examination results report which is routinely carried out every year in accordance with the mandate of the Act. This is in line with the results of research from Priharjanto and Wardani (2017). In his research stated that the audit opinion had a positive and significant effect on the disclosure of the Provincial Government's Financial Statements. A positive relationship indicates that the higher the opinion obtained means the better the resulting financial statement disclosure rate, thus indicating the good quality of the financial statements. It is also in accordance with one of the criteria of giving opinions, namely the adequacy of disclosure. In the Provincial/Regency/City LKPD in addition to being assessed from the level of fairness of financial statements also consider the completeness and presentation and disclosure of LKPD. Based on the analysis and findings of the above research, the following hypotheses can be proposed:

H₁: There is a difference in the disclosure rate of Local Government Financial Statements that have Unqualified Opinion (WTP) with Qualified Opinion (WDP).

Unqualified Opinion (WTP) with Disclaimer of Opinion (TMP)

According to Act No. 15/2004 in the explanation of article 16 paragraph (1), the opinion is a professional statement of the examiner regarding the fairness of financial information presented in

financial statements based on criteria of conformity with government accounting standards, adequacy of disclosure, compliance with laws and regulations, and effectiveness of internal control systems. While based on the level, Unqualified Opinion (WTP) is the highest opinion obtained by the Local Government and Disclaimer of Opinion (TMP) is the lowest opinion obtained. One of the criteria that determines BPK opinion is the adequacy of disclosure. It can be interpreted that the higher the audit opinion obtained by an area, the level of disclosure presented is also high/adequate, and vice versa. In accordance with research from Naopal, Rahayu and Yudowati (2017), local governments that have good audit opinions mean having good financial reporting and implementation and are less likely to cover up this good implementation information and have a high level of disclosure as well. Based on the analysis and findings of the above research, the following hypotheses can be proposed:

H₂: There is a difference in the disclosure rate of Local Government Financial Statements that have Unqualified Opinion (WTP) with Disclaimer of Opinion (TMP).

Qualified Opinion (WDP) with Disclaimer of Opinion (TMP)

BPK opinion on the disclosure level of Provincial/Regency/City LKPD can be a benchmark for the accountability assessment of a Local Government entity. Qualified Opinion (WDP) under SA 508 paragraph 20 (IAI, 2002:508.11), provided if (a) there is not sufficient competent evidence or any restrictions on the scope of the audit which is material but does not affect the overall financial statements. (b) The auditor believes that the financial statements contain deviations from generally accepted accounting principles that have a material impact but do not affect the overall financial statements. Such deviations can be inadequate disclosures, as well as changes in accounting principles. While the TMP opinion is an opinion given when the scope of the examination is limited, so that the auditor does not carry out the examination in accordance with the auditing standards set by IAI which results in the auditor not giving an opinion. This criterion is the first criterion in the formulation of opinions. In addition to the first criterion, in the formulation of opinion must also be met the second criterion, namely the adequacy of disclosure. In accordance with the results of research from Madelia (2018) stated that the better opinion obtained by the local government will increase the level of disclosure made by the local government on its financial statements. So it can be concluded that LKPD with WDP opinion has a higher disclosure rate than LKPD with TMP opinion. Based on the analysis and findings of the above research, the following hypotheses can be proposed:

H₃: There is a difference in the disclosure rate of Local Government Financial Statements that have Qualified Opinion (WDP) with Disclaimer of Opinion (TMP).

RESEARCH METHODS

Selection and Data Collection

This study took the research object of all LKPD Provinces/Regencies/Cities in Indonesia in 2018. In 2018, there were 542 Local Governments in Indonesia that have compiled LKPD consisting of, 34 LKPD provincial government, 415 LKPD district government, and 93 LKPD city government.

The approach used in this study is quantitatively descriptive. This research refers to SAP as its disclosure research instrument. There are 15 sections on the disclosure criteria, namely General Information, Income-LRA, Accumulated Budget Surplus Change Report (LPSAL), Income-LO, Cash Flow Statement (LAK), Equity Change Report (LPE), Expenditure, Expenses, Cash and Cash Equivalents, Receivables, Inventories, Investments, Fixed Assets, Construction Work in Progress (KDP) and Liabilities consisting of 69 sub-criteria.

The sampling technique in this study uses a saturated sample, namely sampling if the entire population is used as a sample and there is no change in the characteristics of the sample (Sugiyono,

2017; Sekaran and Bougie, 2016; Budiarto, 2019). The sample used in this study was LKPD in 542 Provincial/District/City Governments in Indonesia. Data is obtained directly from the BPK by submitting an official data request through the website of the BPK Information Management and Documentation Officer (e-ppid.bpk.go.id).

Data Analysis Methods

Data analysis uses percentage descriptive techniques such as those used by Suwarjuwono (2017). According to Ritonga (2010) states that descriptive percentage techniques are techniques to calculate the level of conformity by making a percentage of the data obtained and then describing the data. In this study, the calculation uses how to divide the total value obtained (disclosure in LKPD) by the total number of criteria (disclosure in PSAP) multiplied by 100% (Suwarjuwono, 2017).

To determine the level of qualified disclosure of LKPD is done with descriptive percentage techniques. The procedures carried out in the percentage descriptive technique are (a) determining and compiling the criteria of LKPD disclosure level on each aspect that has been established in accordance with the provisions in SAP, (b) the conformity of disclosure facts in the LKPD for each aspect is sought, then conducted an analysis of the financial statement advance sheet (on the face) with CaLK, (c) conformity between aspects and criteria with the facts found given value / score. According to Ritonga (2010) giving a score to determine conformity with the criteria. If the fact of disclosure is in accordance with the criteria then a score of 1 while a score of 0 is given for facts not in accordance with the criteria, (d) the total score obtained by each LKPD is summed and then transferred into the disclosure recapitulation working paper to obtain the percentage of disclosure level, (e) the median percentage of disclosure levels is calculated by determining the middle value between the lowest disclosure percentage with the highest disclosure percentage, (f) determine the mean, middle value (median) and frequently appeared value (mode) of the percentage of disclosure level, (g) the distribution of the score obtained is calculated in the disclosure recapitulation working paper, (h) the description and interpretation given for the acquisition of the disclosure level percentage score, (i) perform a different test (Mann-Whitney Test) on the percentage score of the disclosure level obtained to then describe the difference in disclosure rate between LKPD opinions WTP with WDP, WTP with TMP and WDP with TMP.

RESULTS AND DISCUSSIONS

Disclosure of Local Government Financial Statements in Indonesia

It was obtained that the average LKPD disclosure rate in Indonesia was 48,22%. The highest disclosure result was achieved by West Sumatra Province with WTP opinion and Grobogan Regency with WTP opinion. As for the lowest disclosure achieved by Keerom Regency with WTP opinion and got a result of 30,43%.

LKPD disclosure with WTP opinion has an average of 48,53%. No one gets a 100% score from all LKPD with WTP opinion. Keerom County obtained the lowest LKPD disclosure value of 30,43%. While the LKPD with the highest disclosure value is West Sumatra Province and Grobogan Regency at 65,22%.

LKPD disclosures with WDP opinions have an average of 47,25%. No one gets a 100% score from all LKPD with WDP opinion. West Bandung Regency, Eastern Seram Regency and Bintang Mountain Regency obtained the lowest LKPD disclosure value of 36,23%. While the LKPD with the highest disclosure value is Pematang Siantar City at 62,32%.

LKPD disclosure with TMP opinion has an average of 44,26%. No one gets a 100% score from all LKPD with tmp opinion. Mappi Regency obtained the lowest LKPD disclosure value of 31,88%. While the LKPD with the highest disclosure value is Simalungun Regency at 53,62%.

Disclosure Rate Based on Criteria

Table 4. Disclosure Rate Based on Criteria

| No | Criteria | Average |
|----|--|---------|
| 1 | Cash and cash equivalents | 81,13% |
| 2 | Income-LRA | 75,87% |
| 3 | Expenses | 70,86% |
| 4 | Inventories | 69,18% |
| 5 | Income-LO | 67,17% |
| 6 | Cash Flow Statement | 64,91% |
| 7 | Accumulated Budget Surplus Change Report | 57,82% |
| 8 | Fixed Assets | 56,52% |
| 9 | Equity Change Report | 54,68% |
| 10 | Expenditure | 46,40% |
| 11 | Receivables | 42,56% |
| 12 | Investment | 34,53% |
| 13 | Liabilities | 18,97% |
| 14 | General Information | 9,34% |
| 15 | Construction Work in Progress | 4,71% |

Cash and cash equivalents are the most frequently disclosed criteria in LKPD at 81,13%, which means that 81,13% of provinces/regencies/cities have disclosed cash and cash equivalents. The least disclosed criteria is construction work in progress which is 4,71% meaning only 4,71% of provinces/regencies/cities have revealed construction work in progress.

Difference in LKPD Disclosure Rate That Gets WTP, WDP and TMP Opinion

Table 1. Results of Different Tests (Mann-Whitney Test) between WTP Opinion and WDP opinion

| Ranks | | | | |
|------------|-------------|-----|-----------|--------------|
| | BPK Opinion | N | Mean Rank | Sum of Ranks |
| Disclosure | WTP | 433 | 265.96 | 115159.50 |
| | WDP | 85 | 226.61 | 19261.50 |
| | Total | 518 | | |

| Test Statistics ^a | |
|------------------------------|------------|
| | Disclosure |
| Mann-Whitney U | 15606.500 |
| Wilcoxon W | 19261.500 |
| Z | -2.225 |
| Asymp. Sig. (2-tailed) | .026 |

a. Grouping Variable: BPK Opinion

The LKPD disclosure rate that obtained the WTP opinion with the WDP opinion tested with Mann Whitney had a Z of -2,225 (sig=0.026), because sig < 0.05 so it can be concluded that there is

a difference in the level of disclosure between LKPD who obtained the WTP opinion and the WDP opinion. For the first Hypothesis (H1): There is a difference in the disclosure rate of Local Government Financial Statements that have Unqualified Opinion (WTP) with Qualified Opinion (WDP), accepted. The results of this study are in accordance with the results of research conducted by Naopal, Rahayu and Yudowati (2017). In the study, the audit opinion variable had a significant positive influence on the level of LKPD disclosure in 2014-2015. This can be interpreted that the higher the audit opinion obtained, the higher the level of disclosure will be higher as well. WTP opinion has a higher level or value when compared to WDP opinion, so the level of LKPD disclosure with WTP opinion is certainly higher or has a difference in disclosure rate compared to WDP opinion LKPD. Local Governments that have a good BPK opinion mean having good quality reporting and financial implementation as well, so it tends to be more open in conveying financial information contained in the Local Government LKPD. The information contained in the LKPD is certainly with a higher level of disclosure.

Table 2. Results of Different Tests (Mann-Whitney Test) between WTP Opinion and TMP Opinion

| | | Ranks | | |
|------------|-------------|-------|-----------|--------------|
| | BPK Opinion | N | Mean Rank | Sum of Ranks |
| Disclosure | WTP | 433 | 226.26 | 97971.00 |
| | TMP | 13 | 131.54 | 1710.00 |
| | Total | 446 | | |

| Test Statistics ^a | |
|------------------------------|------------|
| | Disclosure |
| Mann-Whitney U | 1619.000 |
| Wilcoxon W | 1710.000 |
| Z | -2.621 |
| Asymp. Sig. (2-tailed) | .009 |

a. Grouping Variable: BPK Opinion

The LKPD disclosure rate that obtained the WTP opinion with the TMP opinion tested with Mann Whitney had a Z of -2,621 (sig=0.009), because sig < 0.05 so it can be concluded that there is a difference in the level of disclosure between LKPD who obtained the WTP opinion and the TMP opinion. For the second hypothesis (H2): There is a difference in the disclosure rate of local government financial statements that have Unqualified Opinion (WTP) with Disclaimer of Opinion (TMP), accepted. The results of this study are in accordance with the results of research from Madelia (2018). In madelia research (2018) showed that bpk audit opinion variables have a significant effect on the level of disclosure of LKPD. WTP opinion is the highest opinion given to the Local Government. Of course, this is achieved easily because BPK from year to year continues to increase limits or standards in the adequacy of LKPD disclosure. Accountability of an entity can be reflected in the acquisition of WTP opinion. The achievement of such opinions must be prepared by meeting the criteria, namely compliance with SAP, adequacy of disclosure, compliance with applicable legislation and effectiveness of Internal Control System (SPI). As for the regions that get TMP opinions in addition to there are some parts of the report that are considered unnatural also in terms of low disclosure levels and less transparent. So that of the two opinions, namely WTP opinion and TMP opinion has differences in LKPD disclosure levels.

Table 3. Results of Different Tests (Mann-Whitney Test) between WDP Opinion and TMP Opinion

| | | Ranks | | |
|------------|-------------|------------------------------|------------|--------------|
| | BPK Opinion | N | Mean Rank | Sum of Ranks |
| Disclosure | WDP | 85 | 51.38 | 4367.50 |
| | TMP | 13 | 37.19 | 483.50 |
| | Total | 98 | | |
| | | Test Statistics ^a | | |
| | | | Disclosure | |
| | | Mann-Whitney U | 392.500 | |
| | | Wilcoxon W | 483.500 | |
| | | Z | -1.683 | |
| | | Asymp. Sig. (2-tailed) | .092 | |

a. Grouping Variable: BPK Opinion

The LKPD disclosure rate that obtained the WDP opinion with the TMP opinion tested with Mann Whitney had a Z of -1,683 (sig=0.092), because sig > 0.05 so it can be concluded that there is no difference in the level of disclosure between LKPD who obtained WDP opinion with TMP opinion. For the third Hypothesis (H3): There is a difference in the disclosure rate of Local Government Financial Statements that have Qualified Opinion (WDP) with Disclaimer of Opinion (TMP), not accepted. The results of this study are in line with research from Suwarjuwono (2017) which obtained the results of the study that there is no difference in the level of inventory disclosure between LKPD qualified opinion (WDP) with disclaimer of opinion (TMP). In suwarjuwono research (2017) mentioned that the adequacy of disclosure related to inventory has not been considered by the examiner (BPK Auditor) in providing an opinion, as well as there are indications that the constituents of CaLK have not understood the provisions of inventory disclosure in accordance with SAP and the accounting policies of some local governments have not detailed regulated the disclosure of inventory according to SAP. The reason for giving WDP opinions to local government LKPD is largely due to the non-compliance of applicable legislation as a legal basis and lack of disclosure in reporting that can be used by the BPK to determine the need for correction to the LKPD. This is also almost the same in local government LKPD with TMP opinion in terms of less disclosure level as well, although for local governments that get TMP opinions there are usually reports that are not believed to be reasonable. So for the level of disclosure of LKPD that gets WDP and TMP opinions are not too different or can be said to have no difference in disclosure levels.

CONCLUSIONS, LIMITATIONS AND SUGGESTIONS

From the above discussion, it was concluded that the disclosure rate of Provincial/Regency/City LKPD in Indonesia fiscal year 2018 is still low and has not been in accordance with the disclosure criteria on SAP, because none of the LKPD has made full or 100% disclosure in accordance with the criteria set out in SAP. This can be interpreted that all local governments fall into the category of not complying in disclosing mandatory information in the LKPD. The average LKPD disclosure rate is 48,22%.

Based on the analysis of different tests using the Mann-Whitney Test obtained the result that there is a difference in disclosure between LKPD who obtained WTP opinion with WDP opinion, there is a difference in disclosure between LKPD who obtained WTP opinion with TMP opinion, but there is no difference in disclosure between LKPD who obtained WDP opinion with TMP opinion.

This study uses data from the Examination Results Report (LHP) on LKPD in fiscal year 2018 alone so there is no comparison with the previous year to see trends or developments in disclosure

rates whether up or down. Future research can use LHP data on LKPD over several years to determine the trend of disclosure rates. The study used secondary data only to collect data. Researchers can further add secondary data with other data collection techniques such as interviews and observations to obtain more accurate and in-depth research results.

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Development of Instruments for The Feasibility of Instructional Media on General Biology Material

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ABSTRACT

Purpose: produce a valid research instrument to measure the feasibility of instructional media on general biology material.

Methodology: This research and development uses the Thiagarajan model, which consists of define, design, and develop. The research subjects were two lecturers out of 10 lecturers in the department of Biology Education at IKIP Budi Utomo. The research instrument is a questionnaire on the validity of the instructional media instrument given to two lecturers. The research data is the instrument validity score and comments from experts. The data analysis technique is descriptive qualitative.

Results: The results of the study indicate that the instrument of eligibility for instructional media that has been developed is valid (99.36%, very valid criteria), so that it can be used as a measuring instrument for the validity of instructional media on general biology material.

Applications/Originality/Value: In the case of existing development research, researchers often rule out testing the validity of the instrument, meaning that here it is necessary to emphasize that the researcher must first test the validity of the instrument. This is important for researchers in the field of formal education and researchers in the instructional media industry so that the research instruments are unquestionable and the research data obtained can be accounted for. So that the instructional media developed will be effective in overcoming learning problems. Thus, the development of this research instrument could be a valuable guide for researchers to use research instruments that have been declared valid by experts.

Keywords: development, research instruments, instructional media

INTRODUCTION

Instructional media have an important role in the current learning process (Aflalo & Gabay, 2013; Sambodo et al., 2018). The form of instructional media that is often used during a pandemic is multimedia which includes a combination of text, images, audio, and video (Khasanah & Muflihah, 2021; Huwaidi et al., 2021). The use of multimedia in learning provides a valuable experience for students (Maria et al., 2019; Sukarini & Manuaba, 2021; Habib et al., 2021). The importance of instructional media as a supporter of the learning process is one thing that needs to be considered in the development process. Some development products are not developed through a development procedure according to the existing theory or the existence of the instrument used does not meet the accuracy aspect.

Instruments are vital in educational research (Md Ghazali, 2016). It is through these instruments that data can be obtained and interpreted. Some media development products were developed using less specific instruments. Based on the validity of an instrument, it must pay attention to aspects of construct validity and content validity. Research by Sari & Iza (2018) and Setiawan & Arifin (2017) shows that the media feasibility instrument has the same aspects or question items even though the assessors have experts in different fields. This is not appropriate because each expert or expert assesses aspects according to their expertise on the product to be developed. If this continues, the credibility and accuracy of the media developed will be inappropriate. Therefore, it is necessary to compile a valid media feasibility instrument to produce instructional media that can be accounted for in terms of concepts, media technicalities, and usability in learning.

In this study, the development of media feasibility instruments focused on content and construct validity. Content validity consists of relevance and representation, correct use of grammar, and conformity with theory. Construct validity contains the suitability between the aspects measured by the theory by experts (Yusoff, 2019; Taherdoost, 2018). The media feasibility instrument by material experts focuses on the truth and accuracy of the material concept. The media feasibility instrument by media experts contains question items related to media design and components. The media feasibility instrument by practitioners contains aspects of the suitability and usefulness of the media in the learning process. The media feasibility instrument by students contains the interest and meaning of the media in learning.

RESEARCH METHOD

This type of research is research and development with the Thiagarajan development model consisting of define, design, and develop. The subjects of this study were two lecturers from 10 lecturers in the Biology Education Department of IKIP Budi Utomo who were competent in the field of educational evaluation. The research instrument used was a questionnaire validation instrument for the feasibility of instructional media. The research procedure begins by compiling the instrument of the feasibility of instructional media based on the established indicators. Next, compile a questionnaire to test the validity of the instrument for the feasibility of instructional media and give the questionnaire to two lecturers in the biology education department of IKIP Budi Utomo. Research data are instrument validity scores and information in the form of comments from experts. The research data analysis technique was carried out by calculating the validity score from the experts through the formula below. Furthermore, the calculation results will be converted in the form of validity criteria (Hidayati, Pangestuti, et al., 2019) as shown in Table 1.

Tabel 1. Validation criteria

| Validity value (%) | Validity criteria | Description |
|--------------------|--------------------|-------------|
| 81-100 | Strongly valid | No revision |
| 61-80 | Valid | No revision |
| 41-60 | Fairly valid | Revision |
| 21-40 | Less valid | Revision |
| 0-20 | Strongly not valid | Revision |

RESULT AND DISCUSSION

Define, at this stage information is obtained about the use of feasibility instruments used by researchers in the Budi Utomo IKIP environment. The instrument for validating the feasibility of instructional media is usually obtained from various sources from the internet that are suitable and used to measure the validity of the developed instructional media. There are no lecturers who have developed a feasibility instrument specifically tailored to the needs. We also found the use of the same instrument to measure aspects that actually differed clearly in terms of expertise. An example is an instrument given to the material expert is exactly the same as the instrument given to the media expert. The feasibility instrument given to the material expert should contain question items about the correctness of the material concept in the instructional media, while the feasibility instrument given to the media expert focuses more on aspects of the media component as appropriate teaching materials. The results of the task and concept analysis show that the instrument for the feasibility of instructional media must be developed according to the domain of each expert so that the assessment can be carried out correctly and in accordance with the characteristics of the user. A summary of the aspects that must exist in each instrument of instructional media feasibility is presented in Table 2 below.

Table 2. Summary of aspects developed for each instrument of instructional media feasibility

| Instruments for each expert | Aspects of assessment that must exist |
|---|--|
| Eligibility instrument for materials expert | The truth and accuracy of the concept of the material presented, the integrity of the material and the systematics of writing, conformity to the curriculum, and conformity of the concept to theory. |
| Eligibility instruments for media experts | Completeness and accuracy of component elements as learning media, visualization and display, ease of operation, security and privacy, technical quality of media, main menu design and typography and submenu details, and appropriateness of the language used |
| Eligibility instrument for practitioners | The accuracy of the learning media with the material and students, the suitability of the design and presentation on the media, the accuracy of the selection of activity elements and forms of evaluation, the completeness of the media as supporting learning activities, and the suitability of the level of knowledge development of students |
| Eligibility instrument for students | Usefulness and meaningfulness of media for students, security and ease of access, independence and flexibility of media use, contribution in developing student knowledge and skills, |

Design, the result of this stage is the distribution of question items on each instrument of the feasibility of instructional media to each expert which is adjusted to the results obtained at the define stage. There are 52 items of questions about concepts developed to be assessed by material experts, 45 items of questions about the elements of media accuracy to be assessed by media experts, 41 items of questions about the implications of media in learning activities, and 32 items of questions about student responses to the media developed. The four instruments developed were then selected in an appropriate format to form a feasibility instrument that is ready to be used to validate instructional media on general biology material. The selection of this format is done to facilitate the assessment by experts with clear instructions for filling out, detailed expert identities, question items are presented in table form and can be filled in using a Likert scale, and there are suggestions and comments columns to improve the developed instrument, as well as sections available. signature as validity in filling out the instrument. The media chosen in this case is print media to accommodate the needs of filling the instrument properly.

Develop, the instrument for the feasibility of instructional media that has been designed, is tested for validity by experts. The results of this activity are the data in the assessment of the distribution of indicators for the development of instructional media feasibility instruments by experts (Table 3) and data on the validation results of instructional media feasibility instruments by experts (Table 4).

Table 3. Assessment data on the distribution of indicators for the development of instructional media feasibility instruments by experts

| Instruments for each expert | Indicators on each aspect | Question number | Criteria |
|---|---|--------------------|----------|
| Eligibility instrument for materials expert | Material equipment | 1f, 1g, 1j | Eligible |
| | The suitability of the material with the curriculum | 1a, 1b, 1d, 1e, 1h | Eligible |
| | Material accuracy | 2a, 2d | Eligible |
| | Systematic presentation of material | 3a, 3b, 3c | Eligible |
| | The truth of the material concept | 2e | Eligible |

| | | | |
|--|--|---|----------|
| | Details of the concept of each material | III, II2, II3, II4, II5, II6, II7, II8, II9, II10 | Eligible |
| | Material presentation | 2b, 2c, 3d | Eligible |
| Eligibility instrument for media experts | Multimedia components | 1a, 1b, 1c, 1d, 1e | Eligible |
| | Multimedia display | 2a, 2b, 2c, 2d | Eligible |
| | Multimedia technical quality | 3a, 3b, 3c, 3d, 3e | Eligible |
| | Visualization accuracy | 4a, 4b | Eligible |
| | Multimedia design | 5a, 5b, 5c, 5d | Eligible |
| | Typography | 6a, 6b | Eligible |
| | Illustration / drawing | 7a, 7b | Eligible |
| | Content design | 8a, 8b, 8c, 8d, 8e, 8f, 8g | Eligible |
| | Typography of each submenu | 9a, 9b | Eligible |
| | Illustration of each material | 10a, 10b, 10c | Eligible |
| | Language Accuracy | 11a, 11b, 11c, 11d | Eligible |
| | Serving equipment | 12a, 12b, 12c, 12d, 12e | Eligible |
| Eligibility instrument for practitioners | The accuracy of multimedia design as a learning medium | 1a, 1b | Eligible |
| | Multimedia equipment | 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 2i, 2j, 2k, 2l | Eligible |
| | Concept presentation | 3a, 3b, 3c, 3d, 3e | Eligible |
| | Activity accuracy | 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4h | Eligible |
| | Evaluation instruments | 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j | Eligible |
| | The accuracy of practical activities | 6a, 6b, 6c | Eligible |
| | Compatibility with user development | 7a | Eligible |
| Student response instrument | Convenience and safety | 2, 3, 4 | Eligible |
| | Complete features | 5, 10 | Eligible |
| | Systematics and material completeness | 6, 7 | Eligible |
| | Integration with science and technology | 12, 13, 15, 17, 30 | Eligible |
| | Usefulness | 8, 11, 16 | Eligible |
| | Evaluation presentation | 20, 21 | Eligible |
| | Usage response | 18, 19 | Eligible |
| | Interest and meaningfulness | 26, 27, 28 | Eligible |
| | Implications for knowledge | 23, 24 | Eligible |
| | Independence | 22, 31, 32 | Eligible |
| | Interactive evaluation form | 25, 29 | Eligible |

Table 3 shows that the distribution of indicators of the developed instrument has met the eligibility criteria, meaning that the question items match the indicators and there are no errors. To compile the instrument for the feasibility of a learning medium, accuracy is needed so that the instrument developed is appropriately and as needed. The pattern of thinking in compiling this instrument must be systematic, where the researcher must adjust each indicator with the question item (Sriadhi et al., 2019). The number of questionable items must adjust to the level of the breadth of the instrument indicators specified. The instrument developed must be relevant to the aspect to be measured (Fatimah et al., 2016). Researchers should not make mistakes in arranging question

items, where a case was found that the same question items were given to material experts and media experts. Questions should be structured with a good sentence structure so that the raters can easily give their assessment.

Tabel 4. Data from the validation of the instrument for the feasibility of instructional media from experts

| Aspects of assessment | Description of each aspect | Validator 1 | Validator 2 | Percentage | Criteria |
|--|--|-------------|-------------|------------|----------------|
| Relevance and representation | Conceptual definition of the instrument | 4 | 4 | 100 | Strongly valid |
| | Operational definition used | 4 | 3 | 87.5 | Strongly valid |
| | Scale on the instrument | 4 | 4 | 100 | Strongly valid |
| | Instrument function accuracy | 4 | 4 | 100 | Strongly valid |
| | Instructions / instructions for respondents | 4 | 4 | 100 | Strongly valid |
| | Representation of the number of items | 4 | 4 | 100 | Strongly valid |
| | Instrument answer format | 4 | 3 | 87.5 | Strongly valid |
| | Scoring on the instrument | 4 | 4 | 100 | Strongly valid |
| Grammatical accuracy of sentences | Grammar on the instrument of eligibility for material experts | 4 | 4 | 100 | Strongly valid |
| | Use of language in the instrument of eligibility for media experts | 4 | 4 | 100 | Strongly valid |
| | The language used in the instrument of eligibility for practitioners | 4 | 4 | 100 | Strongly valid |
| | Language on the instrument of eligibility for students | 4 | 4 | 100 | Strongly valid |
| Eligibility Instrument for Material Expert | Completeness of the material on the media | 4 | 4 | 100 | Strongly valid |
| | The suitability of the material with the curriculum used | 3 | 3 | 75 | Valid |
| | The accuracy of the developed material | 4 | 4 | 100 | Strongly valid |
| | Systematic presentation of material | 4 | 4 | 100 | Strongly valid |
| | The truth of each material concept | 4 | 4 | 100 | Strongly valid |
| | Concept details presented in each material | 4 | 4 | 100 | Strongly valid |
| | Presentation of material on the media | 4 | 3 | 87.5 | Strongly valid |
| Eligibility Instrument for Media Experts | Completeness of media components | 3 | 4 | 87.5 | Strongly valid |
| | General media view | 4 | 4 | 100 | Strongly valid |
| | Media technical quality is met | 4 | 4 | 100 | Strongly valid |
| | Visualization accuracy | 4 | 4 | 100 | Strongly valid |
| | Media design in general | 4 | 4 | 100 | Strongly valid |
| | Media typography | 3 | 4 | 87.5 | Strongly valid |
| | Illustration/image accuracy | 3 | 4 | 87.5 | Strongly valid |

| | | | | | |
|--|--|---|---|-------|----------------|
| | Content design | 4 | 4 | 100 | Strongly valid |
| | Typography of each submenu | 3 | 4 | 87.5 | Strongly valid |
| | Illustration of each material serving | 4 | 3 | 87.5 | Strongly valid |
| | Elements of Language accuracy | 4 | 4 | 100 | Strongly valid |
| | Serving equipment | 4 | 4 | 100 | Strongly valid |
| Instruments of Eligibility for Practitioners | The accuracy of multimedia design as a learning medium | 4 | 4 | 100 | Strongly valid |
| | Multimedia equipment | 3 | 4 | 87.5 | Strongly valid |
| | Concept presentation | 4 | 4 | 100 | Strongly valid |
| | Activity accuracy | 4 | 4 | 100 | Strongly valid |
| | Evaluation instruments | 4 | 4 | 100 | Strongly valid |
| | The accuracy of practical activities | 4 | 4 | 100 | Strongly valid |
| | Compatibility with user development | 4 | 4 | 100 | Strongly valid |
| Eligibility Instrument for Students | Convenience and safety | 4 | 4 | 100 | Strongly valid |
| | Complete features | 4 | 4 | 100 | Strongly valid |
| | Systematics and material completeness | 4 | 4 | 100 | Strongly valid |
| | Integration with science and technology | 4 | 4 | 100 | Strongly valid |
| | Usefulness | 4 | 4 | 100 | Strongly valid |
| | Evaluation presentation | 4 | 4 | 100 | Strongly valid |
| | Respon penggunaan | 4 | 4 | 100 | Strongly valid |
| | Interest and meaningfulness | 4 | 4 | 100 | Strongly valid |
| | Implications for knowledge | 4 | 4 | 100 | Strongly valid |
| | Independence | 4 | 3 | 87.5 | Strongly valid |
| | Interactive evaluation form | 4 | 4 | 100 | Strongly valid |
| Mean | | | | 99.36 | Strongly valid |

Table 4 shows that the developed instructional media feasibility instrument is declared valid with a valid value of 99.36%. This instrument was declared valid from the aspect of relevance and representation, grammatical accuracy of sentences, a feasibility instrument for material experts, a feasibility instrument for media experts, feasibility instrument for practitioners, and feasibility instruments for students as respondents using instructional media. The developed instrument is ready to be used to measure the validity of the instructional media because it fulfills the elements as an independent and appropriate measuring tool (Van Lankveld et al., 2017). The description of each aspect of the assessment of the instrument has been explained precisely so that the feasibility instrument developed is considered valid by the expert. A good instrument must meet the feasibility aspect of validation, both constructs validation and content validation (Walid et al., 2019). Instruments are also developed based on a specific purpose in order to measure accurately in order to avoid instruments that have not been standardized (Kereh et al., 2015).

The relevance and representation of the instrument explain the concept and operational definition of the instrument, the use of the instrument's scoring scale, the accuracy of the instrument's function, instructions for respondents, representation of the number of questionable items, the answer format, and the scoring of the instrument. Conceptual and operational definitions of the instrument must be written out precisely. The scoring scale of the instrument must be determined appropriately based on the aspect of effectiveness. The function of the instrument must be adjusted to the needs. Instructions

for respondents must be explained in detail so that respondents will be easy to give an assessment. The number of questionable items must be adjusted to the breadth of the instrument's indicators. The answer format must be provided properly and easily understood by the respondent. The scoring of the instrument is done by using the right formula so that the correct score is obtained. These aspects are a description of the content validity that must be owned by a research instrument (Yusoff, 2019; Hidayati & Irmawati, 2020).

The number of questionable items must be adjusted to the breadth of the instrument's indicators. The answer format must be provided properly and easily understood by the respondent. The scoring of the instrument is done by using the right formula so that the correct score is obtained. These aspects are a description of the content validity that must be owned by a research instrument (Ihsan, 2015).

The instrument of eligibility for the material expert explains the completeness of the material in the instructional media, the suitability of the material with the curriculum, the accuracy of the material, the systematic presentation of the material, the truth of each material concept, the detailed concepts presented in each material, and the presentation of the material on the media. The completeness of the material in the media must be adjusted to the development of the user's cognitive level. The material in the media must be by the curriculum used and must not deviate from the curriculum. The material on the media must have a systematic presentation that makes it easier for users to understand the material. The material in the media must have the accuracy and correctness of the concept to save users from misconceptions or misconceptions and failures in learning (Mahanal et al., 2016; Azizah et al., 2018). Presentation of material on the media must be attracted by combining text, images, and videos so that users are motivated and enthusiastic to learn. The feasibility instrument for the material expert contains aspects related to theoretical truth which is one indicator of construct validity. If the aspects developed in the instrument are valid, the construct validity of the instrument is also achieved (Kumar et al., 2016; Hidayati & Irmawati, 2019). Aspects of the material that are not described in full on the instrument will affect the accuracy of the concepts in the instructional media (Hidayati, Pangestuti, et al., 2019).

Eligibility instruments for media experts explain the completeness of media components, media appearance in general, technical quality of media are met, visualization accuracy, media design in general, media, typography, the accuracy of illustrations or images, design of material content, the typography of each submenu, illustration of each material presentation, elements language accuracy, and completeness of presentation. The components of instructional media must be complete by providing menus for easy user access. The display of the media must be attracted and not impressive so that users are motivated to learn independently. The layout of the media content must be good and harmonious so that it attracts users. The accuracy of the selection of illustrations or images must be considered so that users become clearer in understanding the contents of the media when viewing the illustrations or images provided. The buttons on the media menu must be ensured to function so that users can easily access the media. The language used in the media must be good so that it makes it easier for users to understand the content of the media. Question items on the media feasibility instrument by media experts have covered the entire function of the media as a supporter of learning activities (Munir, 2012). All aspects of the media expert instrument become a benchmark for the feasibility of a instructional media developed, as in the research by Prayitno & Hidayati (2017); Prayitno & Hidayati (2020) that media must be assessed from all its components so that it can be used in learning.

The feasibility instrument for practitioners explains the accuracy of instructional media design, media completeness, presentation of concepts, the accuracy of activities, evaluation instruments, the accuracy of practicum activities, and conformity to the development of media users. The design of instructional media must be attractive and easily accessible to users. The completeness of the media must be adjusted to the needs in achieving the learning objectives that have been set. The presentation of the concept in the media must be clear so that it will not cause misconceptions

for users. Activities that support the learning process must be available on media such as student activity sheets and practicum activities so that users can learn in their entirety when using the media. Evaluation questions must be provided to the media so that they can be used to measure user competence and user success in learning. Aspects developed in this instrument are carried out to determine the usability and usefulness of media in learning activities so that they can achieve learning objectives (Preeti, 2014). The question items in this section are used as indicators of the accuracy and success of using instructional media in the classroom (Maimunah, 2016; (Hidayati et al., 2019).

The instrument of eligibility for students explains the ease and safety of media, completeness of media features, systematics and completeness of material, integration with information technology, usefulness, evaluation, presentation, response to use, interest and meaningfulness, implications for knowledge, independence, and forms of interactive evaluation. The instructional media developed must be easily accessible to users. The media display should be attractive and the buttons on the media features should function properly. The material in the media must be presented in a systematic and appropriate manner. Media must be integrated with information technology so that users can access media anywhere and anytime. Instructional media must be able to increase user motivation so that users are enthusiastic in learning either classical or independently. The form of evaluation of the media must be interactive so that users can measure their competence after knowing the results of working on evaluation questions. The contents of this instrument meet valid aspects so that later it can be used to measure student responses to the developmental media (Walid et al., 2019; Buzi et al., 2019).

The results of this study provide an illustration that in order to produce a good learning media, you must first go through the instrument feasibility stage. A valid and appropriate instrument will be the right measuring tool for assessing the developed learning media. In contrast to previous research by Setiawan & Arifin (2017), Qomariyah & Prayitno (2018), dan Firdaus et al. (2020) about the development of learning media with assessment instruments that have not been validated. So that this condition causes the resulting learning media to still have shortcomings.

SUMMARY

The instrument for the feasibility of the instructional media developed was declared valid with a valid value of 99.36% so that it could be used as a measuring tool to test the validity of instructional media on general biological material. Research findings can provide valuable input to researchers that they must test the validity of the instrument for the feasibility of learning media first before using it in validating learning media.

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Differences in Student Learning Performance in Online Learning: Based on Gender and Field of Science

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ABSTRACT

Purpose: This study aims to see differences in student learning performance in online learning based on gender and field of science.

Methodology: The sample in this study was 488 students in Indonesia. Collection of learning performance data from student GPA. Data were analyzed using descriptive statistics and non-parametric inferential with Mann-Whitney U with SPSS 20 for windows. The Mann-Whitney U test was carried out to see differences in student learning performance based on gender and field of science.

Results: The results of data analysis with the Mann-Whitney U test obtained the value of sig (0.0) < 0.05 Ha1 is accepted so that it can be concluded that there is a significant difference in learning performance during the covid-19 pandemic based on the field of science. Furthermore, for differences in learning performance based on gender, the value of sig (0.039) < 0.05, Ha2 is accepted so it can be concluded that there is a significant difference in learning performance during the covid-19 pandemic based on gender.

Keywords: Learning Performance, Online Learning, Gender, Field of Science

INTRODUCTION

The development of information and communication technology is growing very rapidly. All fields use ICT as a means to improve performance. The sophistication of ICT has made the flow of information exchange very fast, and communication seems to be without boundaries. In everyday life we can feel that the impact of the development of ICT has occurred in all aspects of our lives, including aspects of education. Education is now no longer something that is exclusive to certain groups, but is more accessible. ICT has opened the barriers that previously hindered access, and has been able to facilitate the delivery and absorption of knowledge at the same time. ICT has also opened access to knowledge in a way that was never imagined in the previous technological era. The use of ICT in education has been very advanced and now there are many alternative ways to provide access, equalize, and optimize the use of existing learning resources. One of them is the implementation of online learning. (Copriady, 2014; Gleason, 2020; Munir, 2010). Several publications have developed extensive online learning in universities (Han & Shin, 2016; Wei et al., 2015). The implementation of online learning such as mobile learning systems on student academic achievement (Han & Shin, 2016) analyzes the interaction effect of online learning on academic scores (Joksimović et al., 2015) and the effect of student perceptions of online learning is measured based on learning achievement (Wei et al., 2015).

Online learning is learning that is done through the internet. The term online learning is often synonymous with other terms such as e-learning, internet learning, web-based learning, tele-learning, distributed learning and so on (Ally, 2008). Online learning is not just sharing learning materials on the internet. In online learning, apart from online learning materials, there is also an online teaching and learning process. So, the main difference between online learning and just online learning material is the interaction that occurs during the learning process. Interaction in learning consists of interactions between the learner and the teacher and/or facilitator (teacher), with other fellow learners, and with the learning material itself (Moore, 1989). The three types of interactions that occur in online learning will create a learning experience that will lead to learning performance.

The achievement of student outcomes in the learning process in higher education can be seen from the GPA (Cumulative Assessment Index) (Saputri, 2015). In the world of work, although it is not completely an absolute basis, GPA is still often used as a requirement in the administration of the recruitment process. In government agencies and private institutions have a predetermined GPA standard in recruiting prospective employees. GPA that shows students' hard skills, companies also want graduates who have soft skills. Stakeholders need graduates who have high competitiveness armed with hard skills and soft skills. Soft skills are categorized into three main categories, namely personal traits, interpersonal skills, and problem solving and decision making skills. In Parkinson's research, John & Simon, (2006) stated that intelligence and personality can predict student learning performance in an effort to complete a case study (Nilawati & Bimo, 2011). Students who have a high level of intelligence with a positive personality will find it easier to study performance. In contrast to students who have a high level of intelligence but are not balanced with a positive personality, individuals will tend to be passive and interact less with students or lecturers.

Research conducted by Lu et al., (2003) looked at learning performance based on learning style, ethnicity, gender, age, employment status, year of acceptance and learning experience in web-based learning. However, Lu et al., (2003) did not examine differences in student learning performance based on the field of science. The research we carried out was to see differences in learning performance based on gender and scientific fields. When the research was carried out, learning was carried out online. Online learning is carried out during the pandemic through a Circular (Kemendikbud, 2020). The Indonesian government prohibits universities from conducting face-to-face lectures and orders them to conduct online learning.

RESEARCH METHODS

This research is a quantitative study using 488 students at universities in Indonesia. Learning performance is obtained from the student's GPA. Data analysis in this study used descriptive statistics and parametric inferential. In this study there are two hypotheses, namely:

Ha1 : there are differences in student learning performance based on gender in online learning.

Ha2 : there are differences in student learning performance based on the field of science in online learning.

Analysis of the data in this study using the help of the SPSS 20 for windows program. The prerequisite test for normality uses the One-Sample Kolmogorov-Smirnov and the homogeneity test uses Anova. The prerequisite tests for normality and homogeneity were carried out to determine the inferential statistical analysis to be used. Inferential statistical analysis used was non-parametric t test (Mann-Whitney U) because the normality and homogeneity of the data were not met.

RESULTS AND DISCUSSION

This research was carried out during the COVID-19 pandemic, which based on a Circular (Kemendikbud, 2020) the Indonesian government prohibited universities from conducting face-to-face lectures and ordered them to conduct online learning. Online learning is a new thing for several Indonesian universities. The level of student learning success can be represented by student learning performance. This study was conducted to see differences in student learning performance in online learning based on gender and field of science.

The following descriptive data on learning performance by gender and field of science is shown in table 1. In table 1 it can be seen that the average performance of female students is higher than male. Meanwhile, based on the field of science, social science students were higher than science students.

Table 1. Descriptive Data on Learning Performance by Gender and Field of Science

| Variable | | N | mean | Std. Deviation | Std. Error |
|-----------------|----------------|-----|--------|----------------|------------|
| Gender | Man | 107 | 3.3442 | 0.75108 | 0.07261 |
| | Woman | 381 | 3.4725 | 0.55685 | 0.02853 |
| Total | | 488 | 3.4443 | 0.60627 | 0.02744 |
| Knowledge field | Science | 264 | 3.4426 | 0.38785 | 0.02387 |
| | Social Science | 224 | 3.4464 | 0.79075 | 0.05283 |
| Total | | 488 | 3.4443 | 0.60627 | 0.02744 |

Prerequisite tests for normality and homogeneity of data were conducted to determine the appropriate data analysis used to answer the research hypothesis. In table 2 it can be seen that the results of the normality prerequisite test are not met, the learning performance data has a probability value $(0.0) < 0.05$ so it can be concluded that the data is not normal. To test the homogeneity of learning performance based on gender and field of science has a probability value < 0.05 so that it can be concluded that the data is not homogeneous. From the two prerequisite tests, it can be concluded that the data were analyzed using a nonparametric t-test, namely the Mann-Whitney U test.

Table 2. Prerequisites for Normality Test of Learning Performance Data

| Variable | Normality | Homogeneity | Conclusion |
|-----------------|-----------|-------------|--------------------|
| Gender | 0.0 | 0.030 | Nonparametric Test |
| Knowledge field | 0.0 | 0.009 | Nonparametric Test |

Student Learning Performance Based on Gender in Online Learning

This research was carried out during the covid-19 pandemic where learning was carried out online. Online learning is a new experience for students in Indonesia. Based on table 3, the gender of female students has higher performance than male students.

Table 3. Descriptive data on student learning performance by gender.

| | N | mean | Std. Deviation | Std. Error |
|-------|-----|--------|----------------|------------|
| Woman | 381 | 3.4725 | .55685 | .02853 |
| Man | 107 | 3.3442 | .75108 | .07261 |
| Total | 488 | 3.4443 | .60627 | .02744 |

The Mann-Whitney U test was carried out to see the significance of differences in learning performance by gender. The results obtained in table 4, the value of sig $0.039 < 0.05$, so it can be concluded that there is a significant difference in learning performance during the covid-19 pandemic based on gender.

Table 4. Results of the Mann-Whitney U test of student learning performance by gender

| Test Statistics ^a | |
|------------------------------|----------------------|
| | Learning Performance |
| Mann-Whitney U | 17718.000 |
| Wilcoxon W | 23496.000 |
| Z | -2.068 |
| asympt. Sig. (2-tailed) | .039 |

Student Learning Performance Based on the Field of Science in Online Learning

The educational process consists of 3 basic elements, namely input-process-output. Among the three elements, the learning process will determine whether or not the ability and learning outcomes of students are good. The success of the learning process will certainly be influenced by various factors, both from the school environment, family or from the students themselves. Both in terms of motivation, attitude or learning style that supports learning success (Rijal & Bachtiar, 2015). In this study, it was found that social science students had higher learning performance than science students in online learning. Table 5 shows that the average GPA of social science students is 3.4464 while science students are lower at 3.4426.

Table 5. Descriptive data on student learning performance by type of field of science.

| | N | mean | Std. Deviation | Std. Error |
|----------------|-----|--------|----------------|------------|
| science | 264 | 3.4426 | .38785 | .02387 |
| Social Science | 224 | 3.4464 | .79075 | .05283 |
| Total | 488 | 3.4443 | .60627 | .02744 |

The Mann-Whitney U test was carried out to see the significance of differences in learning performance based on the fields of science and social science. The results obtained in table 6, the value of sig $0.0 < 0.05$, so it can be concluded that there is a significant difference in learning performance during the COVID-19 pandemic based on the field of science.

Table 6. Mann-Whitney U Test Results of student learning performance by field of science

| | Learning Performance |
|-------------------------|----------------------|
| Mann-Whitney U | 22163,000 |
| Wilcoxon W | 57143,000 |
| Z | -4.771 |
| asympt. Sig. (2-tailed) | .000 |

CONCLUSION

Online learning creates learning experiences that will lead to learning performance. In this study, it was found that there were significant differences in learning performance during the COVID-19 pandemic based on the field of science and gender.

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Economy And Covid as A Reflexivity of Islam Science Language at Plural Worship With R12-R47 Methodology

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ABSTRACT

Purpose: The study has objection to analyzing the existence of economy and Covid with the reflexivity model as R12 to science and language as Islamic structure by R47 methodology. R12 is a simple constant at the beginning of creation. R47 is a complex structure of a physical object in existing creation.

Methodology: These research objects are reflexivity of religion to science as the economy and Covid and sentence of the holy book. The study worked out through books, journals, holy books, and other electronic media. The methodology uses descriptive analytics with similarities and comparative sentences in language grammar. The methods are reflexivity, parallel, and hahslm 472319.

Results: The results are the analogy of R-12 as worship of Plural Pray (Salat Jamak) before R-47. R-47 is the physical connection as the existing creation in-universe. The comparative sentence between 'Not I create jin and human except for worship' with 'Not I create tea and coffee except for guest'.

Applications/Originality/Value: The blueprint presence is reflexivity of the constant 12 stored from the Quran 51.56 verse number (1+5) times (5+6) root of digit 2 becomes $6 \times 2 = 12$. Twelve reflects 1 salat Subuh and 2 salat Jamak (Dzuhur Asar and Magrib Isa). R-12 can be illustrated as religion and R-47 can be illustrated as science where R-12 simple is the same with R-12* complex or R-47. This R-12 and R-47 also can be adapted to languages structures in economic covid age.

INTRODUCTION

Negation sentences have an important role in communicating because they have elements of negation or denial or denial. Negation is a universal concept. Negation serves to deny or deny the statement of the interlocutor that is considered wrong by the speaker himself. In communicating, humans use negative constituents as the most effective tool to deny or deny something. As a tool to deny something, the presence of negative constituents in a sentence changes the meaning of the original sentence. The change in meaning due to the presence of negative constituents is very meaningful because the change can mean cancellation, rejection, or negation (Aziz, 2021a).

Some verses have indications about the intent or purpose of human creation, such indications include, among others, expressions such as; al-ibadah these words are contained in several verses of the Quran (Aziz, 2021b). The phrase al-Ibadah and its musytaq in the Qur'an is repeated 275 times. However, here only a few verses that are most relevant to the subject of study will be presented as:

QS Al-Dzariyat [51] verse 56:

وَمَا خَلَقْتُ الْجِنَّ وَالْإِنْسَ إِلَّا لِيَعْبُدُونِ

"And I did not create the jinn and humans except that they serve Me" (QS Al-Dzariyat [51]: 56)

Then in verse 56 of the letter al-Dzariyat [51], it is explained that the essential purpose of the creation of jinn and humans is to obey Him. In the previous verse, it was revealed how the Quraysh denied the apostleship of Muhammad that they accused Muhammad of being a sorcerer, and so on. This is not something new, because the previous peoples also did the same when rejecting the prophets who were sent. Then the Prophet Muhammad was invited to turn away from them and let him always make remembrance because that is what can benefit the believers (Aziz, 2021c).

THEORETICAL BASIS

The development of the science of reflexivity formed several basic formulas, namely the R-12 formula and the R-47 formula. These two formulas stem from the study of the negation sentence which states «I did not create Jinn and Humans except for worship». With the existence of 2 negation words, namely not and except, this sentence has a double meaning.

The general meaning is to follow the sequence of sentences with the first object of Jin and Man being followed by the second object, namely worship. The words 'no' and 'unless' are used to emphasize that there will be no Jinn and Humans unless there is worship. This negation word requires the presence of worship earlier than the presence of Jinn and Humans. A simple sentence by removing the negation word becomes "I have worship first, then create Jin and Humans".

The simple concept of worship must come first, as the archetype for more complex creations such as Jinn and Humans. The combination of the letter number and the verse number with the pattern 5156. Forms the inner algebra multiplied by the outer $(5+1) \times (5+6)$ in the form of 6×2 where the 11 digit roots are 2, so $6 \times 2 = 12$.

Worship with this constant 12 arises from a combination of numbers, so it is expressed as the equation R-12 ... (1)

The R-12 formula that is in sync with worship can be traced to the plural prayer which has elements 1 and 2. Element 1 comes from the non-plural part of the prayer, namely the Fajr prayer, while element 2 comes from the plural part of the prayer, namely the midday prayer. Asr for the evening prayer, and the evening prayer, the Maghrib Isa prayer.

In Reflexivity Theory it is explained that the source of the object is R-12 in the form of a constant 12, then the reflexivity of an object must also be a constant 12. However, reflexivity 12 has the advantage of more diverse complexity. On the left as a source 12, in the middle as a medium, then on the right as reflexivity is 12 with a derivation like $4+4+4$. The results in the left source will be the same as those in the right reflexivity section. On the left 12, on the right 12, where the meaning of 12^* provides additional knowledge of the existence of details with a more detailed separation of parts.

The 12 constants which are broken down into $4+4+4$ can be further broken down into 4, 72, 319. Where the first 4 are the dependent variable, the second 4 are the independent variables with 7×2 multiplication to get 14 data (taken 4), and the third 4 is also about independent the variable with the addition of $3+1+9$ has the root of the digit 13, which is 4. A combination of numbers 472319 is formed by taking the representation of 1 dependent variable and 1 independent variable, the number 47 is phrased. This number 47 represents 472319 which is defined as R-47.

RESEARCH METHOD

The method used by the author in formulating the values of Islamic education in the Quran Al-Dzariyat verse 56 is the purpose of Islamic education. Such a method can also be called a content analysis method. Content analysis is carried out by unit processing and categorization and interpretation of the commentators. the technique of necessity describes objectively, systematically, and generationally a text (Noeng Muhajir, 1922:28).

The content analysis method can be used in normative research, for example regarding normative Qur'anic texts, research on the Qur'anic text. This method was carried out to find out the thoughts of the mufasssirins regarding the Qur'an in the letter Al-Dzariyat verse 56 about the purpose of Islamic education.

The main types of data in qualitative terms are words or actions, the author's data sources, photos, and from the four data. Of the four data that is used as a study in this research is written data, namely data on educational values contained in the data. al-Quran, books of interpretation (mufasssir) and analysis of Islamic education science.

Source of Data

The source of data used as material for this research is written data. what is meant by the data source is the object from which the data is obtained (Suharsimi Arikunto, 1973:102). The data sources are divided into two, namely basic data (primary) and supporting data (secondary).

Data Collection Techniques

From this research, the technique used to collect data is library research. Cik Hasan Bisri (1988:60-61) suggests that normative research based on reading material can be done by reviewing manuscripts, especially literary studies. In this step, the authors copy data from the commentators' books and notes from educational experts contained in books, websites, and so on.

Data Analysis Techniques

Because this research uses qualitative data, the main sources are the Quran Surah Al-Dzariyat verse 56, books of interpretation on the goals of Islamic education, books on Islamic studies, and related books.

RESULT AND ANALYSIS

The Value of Education in the Purpose of Human Creation

The first purpose of human creation is to serve and serve oneself to Allah SWT (worship). This goal educates people to always increase faith and devotion to Allah SWT because worship can be said to be perfect if it is carried out based on faith in Him. The higher the level of one's faith, the higher the quality of worship performed. Allah SWT and His Messenger commanded a person to always increase and renew faith because faith can experience ups and downs.

The second purpose of human creation is that God places humans as caliphs fi al-ardh, namely humans who are given a high degree to regulate, manage and cultivate all the potential that exists on earth. This situation educates people to always think towards developing the management of all existing potential to create professional human resources (HR). The election of humans as leaders on earth educates them to give a balanced dose for humans themselves that on the one hand, he must be responsible for himself, society, and the universe, and on the other hand, he cannot release himself as a servant who must obey the divine cosmos. (Armai Arief: 2005, 166).

The role of humans as servants of Allah SWT who is assigned to maintain the benefit and welfare of the world, including humans (caliph), educates them to be able to live in society. A good Tarbiyah Ijtimaiyah (social education) is someone who always pays attention to the feelings of others. A Muslim in society is not allowed to hurt his brother even if only by spreading a bad smell. Ibn Qayyim argues, it is not enough just without hurting feelings, a Muslim must be able to make and please his brothers and sisters around him.

The Meaning of Worship

The term essence is familiar as the existence of something itself. It is seen in QS. Adz Dzariyat verse [51]: (56)58 which explains that the essence of 'abd here is more to the root of the word servant to serve and worship, not about who 'abd is, but rather the work or role he is playing. Judging from who the essence of 'abd is anyone and from what kind it is important to be servile or submit to his superiors, this is what is called 'abd.

While the deep nature of 'abd can be known from his duties, this is the true nature of 'abd. Humans are servants of Allah, come from Allah, go to Allah, live with Allah, do good deeds for Allah, take refuge in Allah, return to Allah. The emergence of human creativity to develop their abilities in all fields. With the ability to control his nafs, humans will realize their existence because the human soul (nafs) to achieve muthma'innah nafs requires certain training.

In the religion brought by the Prophet Muhammad SAW., worship is a means of spiritual practice, especially worship that is direct to Allah (mahdhah), such as prayer, fasting, zakat, and hajj. The whole thing makes the human soul (nafs) close to God. The situation to always be close to God as the Most Holy Essence will sharpen a person's sense of holiness.

These are the things that humans should do as servants of His creation to achieve a perfect person. Because, in his life, humans will not be eternal and will then return to Him. The commandment of 'abd with the embodiment of the application of worship, has been written in the Qur'an. One of them is in QS. Adz Dzariyat [51]: (56) which means: And I did not create the jinn and humans except that they may serve Me (Surah Adz Dzariyat: 56).

According to the interpretation of Ibn Kathir, the meaning of the verse is that I created them to tell them to worship Me, not because I need them. Regarding the word of Allah Ta'ala which means "But that they worship Me." Ali bin Abi. Talha narrated from Ibn 'Abbas: "It means except so that they will submit to worship Me, either voluntarily or forced. And that is also the choice of Ibn Jarir. While Ibn Juraij said: "That is so that they know Me." Still regarding His word which means "But that they may worship Me."

Ar-Rabi 'bin Anas said: «It means nothing but worship». Starting from this mufrodat, the term 'abd emerged with the role of a servant who lives only to serve God. Apart from the reality that human life requires activities needed to maintain survival, here 'abd all activities are sure to serve God. By playing that role, 'Abd has fulfilled the value contained in him, namely worshipping the Creator.

Only Allah created and ordered. What He wills must happen, and what He does will not happen. All creatures are subject to the grip of God, and Allah has proof over them. when Allah points it out, no one can mislead it, and when Allah leads it astray, no one can point it.

Today's society mostly is carrying out worship just by simply aborting obligations. Yet they do not realize that his creation was born as an 'abd. Whereas a 'abd must start first and they must climb to the top, with outward worship. However, outward worship is only a manifestation of devotion to Him. By carrying out mujahadah and riyadhoh in the way of Allah. They purify themselves both physically and mentally from all bhasyariah impurities that prevent them from worshipping Allah Rabbul 'Alamin.

With this mujahadah, like people doing meditation, they try to restore the entire human will of hadith to be brought together to the original will of Allah. When on that journey Allah wills to open the door of His servant's heart, then His original will is lowered down so that the two different desires meet in the middle of the road. One will go up and the other will go down. worship is biased toward the real goal, not just worship in the world.

As in Surah Adz Dzariyat, Surah As Saba 'and Surah Al Kahf, it is clear that the worship that is carried out is strongly related to the afterlife or is directed at Allah without any other purpose. It is said that worship for the hereafter is when the purpose of worship is aimed at the true purpose of worship itself, namely worshipping Allah and being carried out properly and all members of the soul and body. All of them carry out worship in their respective ways so that the purpose and purpose of worship reach their goal.

Worship consists of pure worship (nahdhah) and impure worship (ghoiru mahdhah). Mahdhah worship is worship that has been determined by Allah, the form, level, or time, such as prayer, zakat, fasting, and pilgrimage. Worship of ghoiru mahdhah is all human physical and mental activities that are intended to draw closer to Allah. Sex can also be worshiped if it is done according to religious guidance. Well, the verse above explains that Allah wants all human activities to be carried out for the sake of Allah, namely according to and in line with His guidance.

Surah Adz Dzariyat verse 56 reveals various aspects and conceptual angles and goals, all of which are covered by the great essence of the Qur'an, which is considered the foundation stone on which life stands. The first side of this essence is that there exists a certain purpose for the existence

of jinn and humans, which is reflected in the task. 'Abd who carries out and fulfills the task means that he has realized the purpose of being created.

The meaning of worship which is the goal of human existence or which is a human task is broader than just the implementation of symbols. The task of the caliphate is included in the concept of worship. Thus, the nature of worship is reflected in the following main problem.

Humans who live in this world feel that their existence is aimed at carrying out the duties of Allah. Humans have come to rise to obey Allah and worship Him. There is no other goal than Him, no other goal. There is only obedience and the reward he gets for himself in the form of peace and pleasure in his status and deeds. 'Abd who loves the pleasure of Allah and the care of Allah, then in the Hereafter he will find great rewards, pleasures, and gifts.

The Meaning of Worship in the Language

Characteristic 'abd according to the Ministry of Religion of the Republic of Indonesia, based on the interpretation issued, the information that can be obtained from 'abd in Surah Adz Dzariyat Verse 56 characteristics is that either jinn or humans as 'abd always submit to God's regulations, humble themselves to God's will and accept what God ordained, because they were made by God's will and given sustenance according to what God has determined.

The characteristics of 'abd according to Ibn Kasir's interpretation, based on the interpretation issued, the information that can be obtained from 'abd in Surah Adz Dzariyat Verse 56 characteristics is that either jinn or humans as 'abd they always acknowledge their servitude to Allah, either voluntarily or forced and they always know God.

The characteristics of 'abd according to the interpretation of Quraish Shihab, based on the interpretation issued, the information that can be obtained from 'abd in Surah Adz Dzariyat Verse 56 is that both jinn and humans as 'abd always confront God with all their heart movements, limb movements, and movement of life that carries out worship duties and doubles as caliph.

The characteristics of 'abd according to Sayyid Quthub's interpretation, based on the interpretation issued, the information that can be obtained from 'abd in Surah Adz Dzariyat Verse 56 characteristics is that both jinn or humans as 'abd always carry out outward servitude and inward servitude, both ritual, and non-ritual. rituals.

The third purpose of human creation is to carry out the mandate, namely the ability of humans to carry the burden of taklif given by Allah SWT. This educates believers to always maintain trust and obey the command. The mandate that has been determined so that it will not be betrayed, both the trust from Allah SWT and His Messenger and the trust between fellow humans. In addition, humans are also educated to be responsible for all their actions. Because later in the hereafter will be judged to receive a reward or punishment recompense. No one can replace the position of another person to account for his actions. And no one escapes without retaliation (Aisyah Bintu Syati, 1999: 53).

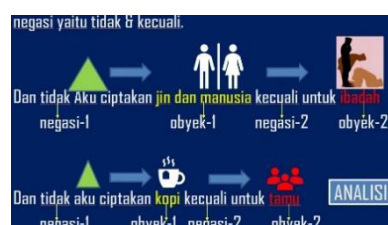


Figure 1. Negation Sentence and analogism.

Source: Analysis, 2021

Diagram 1 shows that in this sentence 2 negative words are consisting of no and except. The first negation word does not mean that I did not create jinn and humans. The syntax in the first

sentence, states that the subject does not create an object, so there is a clause as the inverse of this first sentence. In the second sentence child syntax that except for worship. The meaning of the clause states that there is an exception in the creation of the first negation sentence. This exception means that all will not be created on the condition that there must be worship in the whole sentence process.

Ulama and commentators Most interpret this negation sentence in word order only. Quran experts also do not examine the form of the syntactic sentence. Sentences without negation words will be easier to interpret according to the subject, predicate, and object as well as the order of the objects in the clause. With the presence of 2 negation words in a sentence, it is better to pay close attention because it contains a double meaning to emphasize a change in the object or clause.

Syntax sentences with 2 negation words can be interpreted as positive sentences because the presence of 2 negation words will have a positive meaning. By mathematical logic that negative times negative equals positive. This logic also applies in Indonesian with sentences of 2 negation words in the words no and except. Directly, the contents of the sentence can be rewritten by eliminating the 2 negation words, because negative logic meets negative to become positive.

To simplify the meaning of the sentence, it is necessary to make an analogy of the sentence under study. This sentence is an activity that often occurs in people's lives so that it can be immediately understood. The sentence is, I do not create coffee except for guests. The structure of the subject, predicate, and object in this analogy sentence is the same as the sentence under study, namely that I did not create jinn and humans except for worship.

The words from not I created are identical between the sentence understudy or the first sentence with the analogy sentence or the second sentence. Object 1 in the first sentence, namely jinn, and humans, is replaced with coffee in the second sentence. The negation word except for between the 1st and 2nd sentences is identical or there is no change. Changes occur in object 2 in the first sentence, namely the word worship which changes to the word guest. All objects in the first and second sentences are categorized as nouns, although worship can be categorized as verbs. The urgency of equating all these objects into nouns aims to see the order of priority in the sentence.

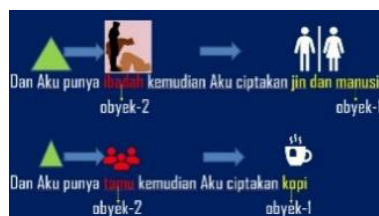


Figure 2. Negation Sentence Analogism.

Source: Analysis, 2021

An Analogism sentence which is the similarity of the main sentence is looking for a simpler one. Without having to understand the syntactic form in the negation sentence, the 2nd sentence as an analogy will be easy to understand. The meaning of the sentence I don't make coffee except for guests stating that my subject will make coffee after the guest is present and physically visible.

The daily activities of people who stay in touch have a process of gathering and being served drinks. A reasonable order according to the priority of events is to gather first in the form of the process of guests being present at the reception location. After the guests are present and gathered, the host as the new receptionist will provide drinks as a courtesy in society.

Indeed, there is a process that can be reversed, such as the receptionist after providing drinks at the majwa which has been provided for guests even though the guests are not present. This still applies to guests who have attended in the form of confirmation of attendance, so that normatively the sequence that occurs is the guest first, followed by coffee drinks.

In diagram 2 modifies the sentence by removing the negation words no and except, it says the sentence I have guests then I make coffee. In this analogy sentence, it reads that my subject receives guests early before making coffee. Another meaning of this sentence is that my subject is still making coffee even though the guest is not present. In this sentence, there is no affirmation that the guest must be there before the coffee is made. Guests may or may not attend but I will still make coffee.

In diagram 1 that I don't make coffee except for guests, it means that there must be guests before the coffee is made. If the guest is not present then the coffee will never be made by me. The guest object must be present early, because the existence of this guest object is a sequence that must be passed before continuing to the next object sequence, namely making coffee.

The understanding in the negation of analogism will change the public's conception of the existence of object 1 and object 2. Visually and literally, the object sequence is read by coffee earlier than the guest who appears last in the object sequence in the sentence. In real life, the meaning of this analogy sentence is that coffee has a purpose as a dish for guests. This is not wrong in the interpretation of the sequence of occurrence of the object. But in society, the purpose of creating coffee is not only for guests, it can also be used for other needs such as eliminating odors. The nuances of the negation sentence I don't make coffee except for steamy guests who are obliged to be guests. The function of the guest is not as the appearance of coffee, but the function of the guest as object 1 for the appearance of object 2, namely coffee.

The Muslim community better understands that the purpose of creating coffee is only for guests by ignoring the 2 negation words. The use of these 2 negation words has a winged meaning apart from the mainstream meaning which states that the first sequence is I created coffee. Then the second sequence, the purpose of coffee is for guests. Sequentially this understanding is correct, but syntactically the negation is lacking in the overall meaning of this negation sentence.

The analogy analysis above also applies to the main sentence by removing the 2 negation words no and except. The meaning generated in the sentence I created jinn and humans for worship, will be directed by the meaning of the sentence. My subject did the first sequence, namely creating jinn and humans, so sequence 1 is the object of jinn and humans. Furthermore, after passing through object 1, the second sequence is to enter object 2, namely worship. So, in this modified core sentence, it will run object 1 then object 2. There is no difference between this modified sentence and the meaning of the sequence in the sentence.

Muslims will accept the meaning of the modified sentence model because it does not require deeper thought and does not need another analogy sentence for explanation needs. If Muslims agree on the statement that my purpose in creating jinn and humans is for worship, this is easy to understand because it is easier to compare the contents of the sentence with the stated meaning.

Comparison with logic presupposes that if A creates B for C. This logical sentence can be easily understood as the goal of A creating B is for C. It is simple and accurate, where A stands with A, B with B, and C with C. On the other hand, not A creates B except for C, it can be interpreted differently, namely by logical sentences by removing 2 negative words no and unless it becomes a sentence like this A creates B for C. The argument that is built because it is by mathematical logic if negative meets negative will become positive. In mathematical equations it can be written as a function: $(-) \times (-) = (+)$.

The deeper meaning and the need for analogous sentences as comparisons make the explanation more complex and tiered. The understanding of analogism in the logical sentence of negation is, not A creates B except C, in the analogy sentence in the form, I don't create coffee except for guests, need arguments and conformity with the reality on the ground. With the notation A, B, C, it is difficult to determine the accuracy of the meaning of the sentence. The analogy of notation with people's habits will be easier to understand even by ordinary people. Substitution of A, B, C with me, coffee, guest nebhadu comparison in the meaning of wings in the negation sentence. The result is that A had C first and then B was created. In the change of people's notation that I had a guest first, then coffee

was created. According to the word order, that A has C, creates B. in the community notation to be, I have a guest creating coffee. Other winged meanings still require 2 negation words, except for guests I don't create coffee or A except C doesn't create B.

This sentence contains 2 negation words which are definite sentences and do not have double meanings. The certainty of the meaning of this core sentence is a reflection of the meaning of the inclusion of 2 negation words in the sentence. The general meaning that has been circulating in society that, I created the jinn and humans have a purpose for worship, needs to be verified again. How to verify it, with, how to ask the question why this sequence of sentences I am a worshiper must use 2 negation words no and except. The question is why the submission of this sentence does not use effective sentences as usual. The answer to this question, because God wills to ensure that there is an undeniable flow of the process of human creation.

It is also possible that God wants to keep the true meaning of this verse while waiting for the people's readiness to accept a deeper meaning with better conditions of civilization. In civilization, Muslims have equalized the level of educational progress with the existence of technology and information. Coupled with the global pandemic conditions that accelerate the digitization process in all fields, including Muslims, they are drawn to interact intensively with information technology. The use of information systems and technology makes literacy more widespread without having to be exposed to the risk of the spread of Covid. Interaction with Islam and science can continue even though the economic situation is in crisis.

The modified core sentence in diagram 2 contains a sentence without 2 negation words so that it contains I created jinn and humans for worship. The immediate meaning of this sentence is simple and easy to understand. The displacement of the order of objects changes when this sentence is by the original with the presence of 2 negation words in the form of I did not create jinn and humans except for worship. Syntactically understanding in the negation sentence is carried out in 2 stages, firstly the object of worship moves from the 2nd object to the 1st object, the second eliminates 2 points of negation no and except. The sentence formed is, I have worship then created jinn and humans. This sequence of events is more logical and by the logic of human thinking. Although God can go through a normal process that can be accepted according to Kun Fayakun, for consistency, the sequence is stated in the verse as part of sunatullah or events that can occur logically (R Mochamad, 2020).

With the existence of worship before the jinn and humans, it will change the paradigm in the conception of life. Worship in the verse is the initial design in creation. This means that God had a basic design before the universe was formed at all. It can be said, when there is only God and everything is empty, it turns out that God already has the basic design concept of worship. Based on the initial design of the worship, then God created the jinn and humans. So, in the creation of the jinn and humans, the basic design of worship is stored, so that worship other than as a goal is scored in the body structure of the jinn and humans. The manifestation of this meaning is kept in the verse with the affirmation of the 2 negation words.

The meaning will not be created by jinn and humans except for worship, implying the meaning that God already had an initial design of worship before jinn and humans were created. The creation of the body structure of jinn and humans is based on the basic design of worship.

The design of worship is a constant that cannot change and becomes a basic element for the development of science as well as humans and the universe. This blueprint of worship is like an analogy to a house plan or a blueprint of a house by an architect who will build a house. At first, there was only one architect, then this architect would first make a blueprint for the house, and had not yet started building a house. After the blueprint of the house is completed, it is continued with the activity of building a house by the architect.

With the similarity of the architectural process which is patterned, namely architect, blueprint, and house, then the meaning of worship in the negation sentence can also be reflected like this

sequence. Before the jinn and humans were created, the creator, namely Allah, had made a blueprint for worship first. The same sequence pattern becomes God, worship, and man.

The blueprint of worship that appears is in the form of a constant, namely the 12. These twelve come from the meaning that the main worship in Islam is prayer. Salat consists of 17 rakaats a day and a night. This seventeen encryption turned out to be stored in the verse of worship by counting the sum of all the letter numbers and the verses number, namely $5+1+5+6=17$. While the constant 12 or can also be called one or two is the reflexivity of the plural prayer model, namely 1 dawn prayer, 2 plural prayers (plural dzuhur asar, plural magrib isa). The presence of this constant 12 is reinforced by the presence of a letter code in QS. Adz-Dzariyat 51.56 with simple arithmetic in the form of internal addition and external addition. The outer numbers of 5156 are 5 (five) and 6 (six), and the simple addition of 5 and 6 is $5+6=11$ where $5+6=11$. This 11 (eleven) number has a digital root, namely $1+1=2$, where 2 is the Fajr prayer that is not included in the prayer that can be plural or combined. The inner number of 5156 is 15 (fifteen) and this number is the sum of all the plural prayers consisting of the Dzuhur Asr prayer ($4+4=8$) and the Maghrib and Isa prayers ($3+4=7$). The total of the plural prayers is $8+7=15$ which is the same as the inner number of this worship verse. So, in this verse, the constant 12 is stored as a symbol of the blueprint of worship before the jinn and humans were created.

The meaning of worship comes first than humans, giving the understanding that in humans it is composed of elements of worship. Because the initial basis for human formation is in the blueprint of worship, which is symbolized by the constant twelve or prayer. In humans, there are also compositions of 12 forms because they are the reflexivity of the blueprint. Among the constant formations that appear in humans, can be seen on the inside of the human palm or the bottom (which is brighter). On the human right hand in an open state, you will see line 1 separated by 2 lines at the side. This first line is a representation of the number 1. While the other 2 lines can form 2 Arabic numbers such as the lowercase r and these 2 lines represent the number 2. The combination of the number 1 and number 2 can form the number 12, where 12 is a constant number found in the meaning of the verse of worship. So, in humans, there are also constants 12 to remind humans that the origin of humans was created based on the foundation of worship.

CONCLUSION

The syntax of the negation sentence does not and unless it contains 2 meanings, namely the first to move the object and the second to provide an affirmative meaning. The sentence I did not create jinn and humans except for worship means that the object of worship existed before there were jinn and humans and the initial design of creation was worship.

Humans were created by Allah SWT to worship Him and become the Caliph of Allah SWT on earth (Khalifah Allah fi al-Ardh). In carrying out these two missions, humans are also given a fairly heavy burden, namely in the form of al-amanah or the burden of takhlif. All of that will be accounted for before Allah SWT in the form of rewards and sins or the rewards of heaven and hell by the levels of al-worship, al-khalifa, and al-amanah that he did while living in this world. Jinn and humans live between different dimensions. In the Qur'an, it is explained that humans cannot see the jinn, but these two creatures can communicate because there is an explanation in the Qur'an about the occurrence of communication, both when the genie learns the Qur'an from the Prophet Muhammad or the incident. what the ancients did to ask for help from the jinn, there were even some groups who worshipped the jinn.

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Exploring How Secondary School Principals Implement Multicultural Education in The Freedom of Learning Era

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ABSTRACT

Purpose: The program “Sekolah Penggerak” (School Activator) implemented in Indonesia in the recent years is conducted to encourage school principals in realizing an advanced Indonesia that is sovereign, independent, and has personality through the creation of Pancasila Students. One of the indicators of Pancasila Students is global diversity. This study aims to explore how two senior excellent high schools in Surakarta manage multicultural education especially on developing students’ character “global diversity” (kebhinekaan global). The schools are chosen as activators and motors of the country’s educational transformation program. Both are characterized by having students with various cultures (religion, ethnicity, gender, economic social background, and culture).

Methodology: This is a qualitative study in which the researcher applied ethnography. To collect the data, the researcher interviewed the three schools’ principal, teachers, and students. In addition, the researcher observed the schools and collected documents.

Results: The findings show that the schools principals plan the education character by involving teachers, staffs, and parents. To monitor the implementation, the principals assign the senior teachers to help them monitor the implementation. They also revitalize the school activities which encourage students with various background to communicate and collaborate. Evaluation and Reflection are conducted once a month.

Keywords: multicultural education, global diversity, school principals

INTRODUCTION

The Indonesian Ministry of Education and Culture has launched eight reforms of educational policy program known as Merdeka Belajar or Freedom of Learning. The policy programs are learner’s performance assessment, lesson planning and school zoning system, Merdeka Campus, School Operational Assistance Mechanism (BOS), Mobilizing Organization Program (POP), School/Teacher Mover, College Fund Transformation, and the language and culture improvement. All of the programs are conducted to achieve the goal of realizing an advanced Indonesia that is sovereign, independent, and has personality through the creation of Pancasila Students (Pelajar Pancasila). Pancasila Students are characterized by six indicators namely, (1) faith, fear of God Almighty, and noble character, (2) global diversity, (3) mutual cooperation, (4) independent, (5) critical reasoning, (6) creative. Out of the six indicators of Pancasila Student profile, global diversity is a very pivotal aspect to prepare students to interact with people around the world having various background culture in the global era.

The development of knowledge and technology today encourages the formation of global communication where people around the world can communicate easily. Through various applications, people can connect with people who have different cultural, region, social, economic background, gender, ethnic and ethnic backgrounds. An open attitude towards these differences will encourage the creation of good and harmonious communication in the communication process. On the other hand, lack of knowledge and choice of differences can facilitate handling, stereotypes, and discrimination. Sensitivity to diversity should ideally be given to students so that later they will be able to communicate well in the wider community in order to create a peaceful and better life around the world. Sensitivity to cultural diversity is necessary to maintain multicultural interactions (Dike et al., 2020; Salgur & Gursoy, 2015; Altan, 2018). Education equips students with knowledge and mutual

respect and understanding of the diversity that exists in their environment so that later they will be able to communicate and adapt well in a multicultural environment.

School as a miniature community where students learn to live harmoniously in society is the right place to socialize. As stated by Zaitun (2018), socialization is a process to help the development of students to become human beings who can adapt well in the midst of society. In this socialization process, multicultural education which includes tolerance, understanding differences, and mutual respect can be instilled. Through this process, discrimination, prejudice, stereotypes that may arise in a multicultural society can be minimized. In order that students can learn to socialize, good environmental management is needed. In this case, the principal is the main person in charge of managing the environment in which students learn how to socialize. As shown by previous research, principals have a major role in managing multicultural education. Principal leadership influences the creation of a positive climate, motivation, and teacher performance (Nurcholish, 2019; Qurtubi, 2017; Sa'adah, 2018; Salimin et al., 2021; Wachira et al., 2017) (Kartikawati et al, 2018)). Good school environment management will encourage the formation of positive attitudes in the school community and support the achievement of achievements and goals that have been set.

In its implementation, Banks describes five dimensions that must exist. The first, there is an integration of education in the curriculum (content integration). It involves diversity in an educational culture whose purpose is to reduce prejudice. Second, the construction of science (knowledge construction) which is realized by knowing and understanding comprehensively the diversity that exists. Third, the reduction of prejudice which was born from the interaction between diversity in educational culture. Fourth, the pedagogy of human equality (equity pedagogy) which gives room for and equal opportunity to each of the various elements. Fifth, empowering school culture (empowering school culture). The fifth thing This is the goal of multicultural education, namely for schools to become elements of education social relief (social transformation) from an unequal social structure to fair structure.

As stated by Baidhaw (2005), the environment to support the creation of a tolerant attitude towards diversity can be identified through nine indicators. The nine indicators include: learning to live in differences, building mutual trust, maintaining mutual understanding, upholding mutual respect, being open in thinking, appreciation and interdependence, conflict resolution and reconciliation. The nine multicultural values can be accommodated by transformational leaders. This type of leadership provides intellectual direction and innovation in an organization while empowering and supporting members in decision making (Balyer, 2012; Conley & Goldman, 1994; Jackson & Marriott, 2012; O'Malley & Capper, 2015; Price, 2012; Silins et al. al., 2002). Transformational leadership differs from hierarchical and procedural models. Transformative leaders apply a shared instructional leadership approach by seeking to increase participants' commitment to the organization (Dvir et al., 2002; Kraft et al., 2019; Neumerski, 2012; Thoonen et al., 2011). In the process of managing activities, as a manager, the principal has the main task as a planner, organizer, leader, and controller (Goerge R. Terry in Danim & Khairil, 2010; Mulyasa, 2007; Wahjosumidjo , 2010). Organizer is a very important function in implementing programs in schools (Ankoma-Sey, 2020; Ginting, 2020; Amaliyah, 2018). This function is carried out to control activities so that they are directed to the goals that have been set and minimize the occurrence of problems that can interfere with the implementation of the program. In carrying out program control, the principal should be able to synergize with members of the school community well. In the digital disruptive era, with this fast-paced information change, the principal must be agile and resilient in dealing with problems and finding solutions to existing problems (Haryatmoko, 2020). As stated by Haryatmoko (2020), in order to solve problems, find solutions, and other creative ideas, the most appropriate leadership structure is network, not linear. The right leadership pattern to implement is transformative. Yukl (2005) formulated four characteristics of transformative leadership, namely idealized influence, individualized consideration, inspirational motivation, and intellectual stimulation.

Previous research shows that multicultural education has been widely implemented. However, the similar study is still needed to find an ideal model of multicultural education. In this study, the researcher explores the role of school principals implement multicultural education in “The Freedom of Learning Era” or “Era Merdeka Belajar” focusing on how they create school environment which support the realization of multicultural education. Assuming that school management is influenced by the basic values held by the foundation, the researcher explored two senior high schools having students with various cultural backgrounds, namely SMA Negeri 3 Surakarta and SMA WARGA Surakarta. The previous school, located in the center of Surakarta city, is one of the 10 excellent schools in Surakarta. There are 1195 students with various gender, economic background, ethnicity (Javanese, Chinese, and Sundanese, and Arabian), and religion (Moslem, Catholic, Christian, Hindus, and Buddhist). The later is a private affiliated school with 386 students learn in it. The same as the previous school, SMA WARGA is colored by the students having variety of cultures

On the basis of the problems above, the study explores how three secondary school principals in Surakarta manage multicultural education, especially in creating environment which support the realization of multicultural education. The three schools chosen are led by transformative leadership types leading teachers and students who have different cultural background. The two schools are public and private non-religion schools.

METHOD

The study is categorized as qualitative research. Data sources are divided into two, namely primary data and secondary data. Primary data is data obtained by the researcher directly (first hand), while secondary data is data obtained by the researcher from the existing sources. Primary data were obtained through in-depth interviews with several sources and observations of teacher and student activities in the teaching and learning process, and character strengthening. Secondary data is obtained through document review. This document study is a collection of data through written sources at SMA Surakarta where most of the available data are documentaries such as books, letters, diaries, reports, pictures, photos, videos, and data stored on websites or hard drives. Of the four existing qualitative research designs, namely: narrative inquiry, phenomenological, grounded theory, ethnographic, and case study, the design used in this research is ethnography.

FINDINGS AND DISCUSSION

In this part, the researcher described the results of the observation and interview with the teachers and students. Since the study focuses on how the school principals manage the school climate which supports multicultural education, so the researcher categorizes the findings into four namely bullying cases, the methods applied in the teaching and learning process, the interaction among the school community, and school facilities. Each of them is discussed below.

Bullying cases

Bullying cases rarely occur in these two schools. The As the co-principal of SMA 3 Surakarta stated:

“Sekolah yang memiliki siswa yang berlatar belakang budaya heterogen memang rentan terjadi perundungan. Perundungan memang masih ada, namun jumlahnya sangat sedikit dan jarang. Hal ini karena ada pencegahan yang dilakukan oleh sekolah.”

(Schools with students from heterogeneous cultural backgrounds are prone to bullying. Bullying does still exist, but the number of cases is very small and rare. This is because there are efforts to prevent this to happen)

In line with the co-principal, one of the teachers explained the efforts to prevent bullying to happen.

“Salah satu usaha yang dilakukan adalah dengan usaha pencegahan, misalnya selalu mengingatkan guru untuk memberikan contoh berperilaku yang baik, menghindari “body shaming” atau menjuluki siswa dengan julukan-julukan tertentu, menghormati satu sama lain dalam berinteraksi.”

(One of the efforts made is by prevention efforts, for example always reminding teachers to give examples of good behavior, avoiding «body shaming» or calling students with certain nicknames, respecting each other in interacting.)

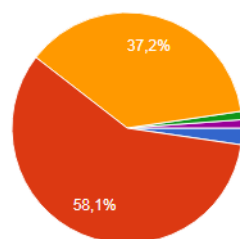
One of the teachers also mentioned that there is a meeting conducted once a week to discuss the academic and non-academic activities done in a week, the reflection of what they have done in the previous week. This meeting is not only for the principals to remind the teachers about their duty in teaching but also to discuss the problems they have in a week.

Teaching and learning process

The implementation of multicultural education is also done in the teaching and learning process. This education is both implemented explicitly in Sociology subject, Civics, Religion, and Bahasa Indonesia, but also implicitly in the teaching methods. Explicit teaching of multicultural education is done in particular subjects by giving examples and problems to discuss. As an example, when a civics teacher intends to teach living harmoniously in a society, he gives example of bullying case or social conflict in a society. Based on the cases, the teacher asks the students to analyze the possible causes of the problems and the solution. Through the process of discussing the problems, it is expected that the students can learn norm and values in living in a plural society. What follow are the indirect implementation of multicultural education.

1. Praying in the beginning and the end of the lesson based on the students' belief.
2. Teaching models
Project-based and problem-based learning are the most widely applied methods in the teaching and learning process. These kinds of models do not only inflict the students' autonomous learning and higher order thinking skills but also enable them to interact with each other in a group.
3. Grouping students
Most of the methods applied by the teachers in both of the schools are group works. In making the group, the teachers do not always

7. Dalam kerja kelompok,
86 jawaban



- Apakah kamu yang memilih teman?
- Ataukah guru yang menentukan dengan siapa kamu bekerja kelompok?
- Kadang guru kadang pilih sendiri
- Terkadang Bapak/Ibu guru yang menentukan dan terkadang kita memilih sendiri
- Jika Kerja kelompok guru sering memilih teman kerja kelompok, jarang untuk disuruh mencari teman untuk membu...

Figure 1. The results of survey to students of SMA WARGA about grouping

11. Dalam diskusi atau tugas kelompok, siapakah yang menentukan anggota kelompok?

146 jawaban

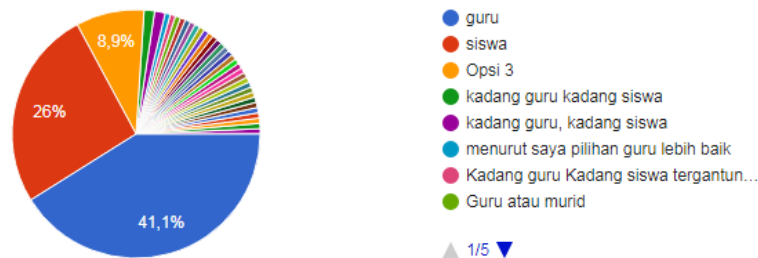


Figure 2. The results of survey to students of SMA WARGA about grouping

In the interview with the English teacher of SMA 3 Surakarta, it is found that grouping students are randomly is done by the teachers in order that the students can learn how to communicate positively with students from various cultural background. The teachers can easily teach how to control emotion, solve problems, and respect others.

The interaction among the school community

Creating a positive climate is a very important aspect to be implemented in both schools. The positive situation will not only become model for the students to imitate but also create a comfortable place to learn and to interact. To encourage the school community respect one another,

Senyum, salam, sapa (greetings and smiles)

This is the most common strategy implemented by the schools to create a harmonious climate in order that all members in a school interact. The strategy is done also to develop respect among students and the students with their teachers, and other education staffs. As they meet in school they greet in Bahasa Indonesia or Javanese.

Poster

Poster is a short type message which is usually put in a public area in order that people can easily understand the message. The posters put in the schools contain messages to are eye catching and



Figure 3. poster containing a massage to respect others

Doing activities together

Prinsip multikultural sangat terasa dalam proses pendidikan di SMP Tumbuh Yogyakarta. Lingkungan dan iklim yang sangat baik, di antaranya, dalam lingkungan sekolah siswa begitu akrab dengan perbedaan ras, suku, dan agama. Hal terpenting lainnya adalah terdapat peringatan hari-hari besar keagamaan yang diikuti seluruh siswa, adanya program peduli lingkungan yang mengajari makna hidup bersama.

School facilities

It can be seen from the way the Capacity and Culture The implementation of multicultural value education that is formed from school culture and class culture at the YPSIM can be seen through several facilities that support the implementation of multicultural values, among which can be seen from several programs as follows, 1. School monuments that represent the foundation's vision, 2. Religious Education discussing universal values, 3. Celebration of Religious Holidays and Bhineka Tunggal Ika (Unity in Diversity), 4. Seating arrangements as a way of interacting and cultural exchange, 5. Praying activity according to each religion and belief before the lesson takes place and after the last lesson, 6. Providing worship facilities or pavilion at school.

Kebhinekaan global

Pelajar dengan Profil ini adalah Para siswa diharapkan mencintai keberagaman budaya, agama dan ras di negaranya serta dunia, sekaligus menegaskan mereka juga warga global.

School climate is a multidimensional construct that represents "virtually every aspect of the school experience" (Wang and Degol, 2016_[18]). While researchers have not reached a consensus on the indicators that make up school climate, four spheres of school climate emerge from previous research (Cohen et al., 2009_[15]; Thapa et al., 2013_[19]; Wang and Degol, 2016_[18]):

- **Safety:** includes maladaptive behaviours, such as bullying, disciplinary problems in the classroom, substance abuse and truancy, and also the rules, attitudes and school strategies related to these maladaptive behaviours. This sphere is renamed as student disruptive behaviour in this volume as only maladaptive behaviours are examined.
- **Teaching and learning:** includes aspects of teaching, such as academic support, feedback and enthusiasm, aspects of the curriculum, such as civic learning and socio-emotional skills, and indicators of teacher professional development and school leadership, such as teacher co-operation, teacher appraisal, administrative support and the school vision.
- **School community:** includes aspects of the school community, such as student-teacher relationships, student co-operation and teamwork, respect for diversity, parental involvement, community partnerships, and outcomes of these indicators, like school attachment, sense of belonging and engagement.
- **Institutional environment:** includes the school resources, such as buildings, facilities, educational resources and technology, and indicators of the school organisation, such as class size, school size and ability grouping.

Pelajar Indonesia mempertahankan budaya luhur, lokalitas dan identitasnya, dan tetap berpikiran terbuka dalam berinteraksi dengan budaya lain, sehingga menumbuhkan rasa saling menghargai dan kemungkinan terbentuknya dengan budaya luhur yang positif dan tidak bertentangan dengan budaya luhur bangsa. Elemen dan kunci kebinekaan global meliputi mengenal dan menghargai budaya, kemampuan komunikasi interkultural dalam berinteraksi dengan sesama, dan refleksi dan tanggung jawab terhadap pengalaman kebinekaan.

Planning is done in the beginning of a semester. The three school principals work with their co-principals to design the activities. After the principals designed the plan, they invited teachers, academic staffs, and school committee. The results of the meeting were used to better the planning.

Focusing on the Dealing with the Discussing the plan at the beginning of a semester. School rules – school as center of culture . Organizing

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Implementation of E-Learning Based on Mic.Teams In Science Learning In Elementary School

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ABSTRACT

Purpose: This study aims to describe 1) Mic.Teams e-learning planning on science online learning in Elementary School 2) implementation of Mic. Teams -based e-learning 3) Mic.Teams based e-learning evaluation.

Methodology: This research approach is qualitative, with descriptive method. Data were collected by interview and observation. Interactive data analysis techniques are data reduction, data presentation, and drawing conclusions. While the validity of the data with triangulation techniques and sources. Data sources consist of principals and teachers.

Results: The results showed that 1) Mic.Teams e-learning planning on science online learning at SDN 1 Wonogiri are carried out systematically by the school and teachers, namely the school principal's policy of forming an IT E-Learning teams, register teachers and students in office 365 accounts and teachers prepare distance learning tools in the form of syllabus, prota, promissory notes, lesson plans, teaching materials, assessment programs and LKPD. 2) Implementation of Mic.Teams -based e-learning begins with the teacher creating a virtual class and including members in the created class and utilizing the online meeting features, posts and assignments in learning 3) Mic.Teams based e-learning evaluation are conducted every month covering the cognitive, affective and psychomotor domains. The results of this study are used as a source of input and reflection material for schools about the implementation of Mic.Teams and as material for self-evaluation to contribute to efforts to improve the quality, process and learning outcomes of students online.

Keywords: Utilization, E-Learning, Mic.Teams

INTRODUCTION

Currently the world is still faced with the COVID-19 virus pandemic which has spread, not only Indonesia, but other countries are also affected by this pandemic. The government has made efforts to reduce the spread of this virus, including social distancing policies. In 2021 the government will enforce the PPKM policy (Enforcement of Restrictions on Community Activities), starting from Emergency PPKM to PPKM Level I to IV. This pandemic has an impact on various sectors, resulting in the rate of growth and development of the nation being hampered. Sectors affected by this pandemic include social, economic and education. The Education Unit is one part of the education sector that is directly affected by the COVID-19 pandemic, namely by hampering student learning activities. Nevertheless, the process of learning activities for students must continue to run and be carried out even though it is not face-to-face. During the Covid-19 pandemic, schools must continue to carry out learning for students (Wibowo & Khairunas, 2020).

Online learning is an alternative in learning that is carried out to carry out learning during the pandemic by not meeting face to face. Online-based learning continues to be pursued by all education stakeholders, so that learning continues to be carried out according to the nature of learning. The definition of online learning is that E-Learning is a technology that has made a major contribution to the improvement of the learning process (Dzul Rachman, 2019). According to Gunawan, (2020) online learning is one type of electronic-based learning. The tools that can be used in this learning include smartphones, laptops or computers that are supported by an adequate internet network.

Each education unit is looking for the easiest and most suitable application platform according to the ability of teachers and students to adapt the changes in the learning process from face to face to Distance Learning (PJJ). (Yuangga & Sunarsi, 2020). According to Jayul & Irwanto, (2020) distance

learning is a learning approach that is not directly face to face during learning. Internet-based media are usually used in learning. For example animated videos, Youtube and google classroom, WhatsApp and others(Rahmawati, 2016). Purpose One of the applications that can be used to support distance learning is Microsoft Teams or called Mic.Teams. Mic.Teams is part of Microsoft Office 365. According to Martin & Tapp (2019) Microsoft Office 365 channels are the collaboration spaces within a Team where tutors and learners work collaboratively on tasks or access learning materials. Microsoft Teams 365 (Ms Teams) is a learning platform that allows teachers and students to collaborate and interact during online learning(Rahmawati & Sulistianingsih, 2020).Although there are several application options such as google classrooms, zoom meeting which has been used since the beginning pandemic however, the school is not able to monitor and evaluate teacher performance and student involvement during the teaching and learning process. One of the weaknesses of the application used before Mic.Teams is that the application does not have Indonesian language features, so its use is less effective and efficient for learning with students. This is confirmed by research(Yulistyanti et al., 2021) which states that the zoom technology does not provide Indonesian language as a feature to support discussions or live broadcasts.

After a meeting was held between the principal and the teacher, the result was decided that the suitable and suitable Platforms for use in online learning between teachers and students at SDN 1 Wonogiri was the Microsoft Teams application or Mic.Teams. The decision was taken because both teachers and students at SDN 1 Wonogiri already has a Microsoft Office 365 account. Because with this account, teachers and students will be able to log in by accessing the Mic. Teams easily. This decision was welcomed by the teachers because with these platforms they were confident that they could carry out the learning process with students even though they were online. Before starting learning with Mic.Teams with students, the teacher first took part in the training held at the school. For students, they do not experience significant difficulties because they are millennials who are not technologically stuttering. With the Mic app. Teams, learning is easy to follow, virtual classrooms are available, teachers and students can hold discussions through the meeting room (meeting), teachers can greet and make announcements in public posts, teachers can send assignments in the task menu. Microsoft Teams is an application made by Microsoft which is designed in one package that has a complete program. This application is designed so as to make it easier for users to access information flexibly that is not bound by time and place teachers can say hello and make announcements in public posts, teachers can send assignments in the task menu. Microsoft Teams is an application made by Microsoft which is designed in one package that has a complete program. This application is designed so as to make it easier for users to access information flexibly that is not bound by time and place teachers can say hello and make announcements in public posts, teachers can send assignments in the task menu. Microsoft Teams is an application made by Microsoft which is designed in one package that has a complete program. This application is designed so as to make it easier for users to access information flexibly that is not bound by time and place(Widiyarso & Sutama, 2021).

Some research on learning to use Microsoft Teams during the Covid 19 pandemic, namely:(Situmorang, 2020). The research is to find out the percentage of achievement in learning interest in mathematics education program students from FKIP UHN who are taught by learning Microsoft Teams for Education). The results of the research show that: 1) Overall, the interest in learning of students who take lessons using Microsoft Teams for Education is in the «Very Good» category because 94 people out of 110 people or around 85.46% of students have achieved high scores (?75). . 2) The percentage increase in the achievement of student interest in learning before and after learning the concept achievement model for each indicator is 49.22%, 49.48%, 49.48%, and 52.34 (all categories are very good).

Kartini.(2021). His research is on the adaptation of class X students to teaching staff and learning through the TEAMS application from Microsoft Office 365 in the Distance Learning process during the pandemic. The results of the research are that by using the TEAMS application students can study well, providing opportunities for easier learning and students feel happy because they can meet

the teacher and can get explanations of assignments and materials by the teacher even though they are virtual.

Afiani & Faradita. (2021). Her research on online learning using Ms. Teams during the covid-19 pandemic in class IV SD Muhammadiyah 26 Surabaya. The results showed that the students' activities during online learning using Ms. Teams during the covid-19 pandemic (1) students paid attention to the material during online learning, (2) students did not focus on listening to the teacher when online learning took place, (3) students were less active in asking questions during online learning, (4) students copied the material provided. given by the teacher in online learning, (5) students are less creative in responding to the teacher's explanation when online learning, and (6) students are enthusiastic about participating in online learning from the beginning to the end of the lesson accompanied by timely attendance. Some of the constraining factors when learning online are: (1) lack of awareness of parents or guardians of students that online learning is very important, (2) limited facilities owned by students, (3) unstable network conditions.

Based on the previous explanation, it can be seen that Mic.Teams learning has been widely applied and researched its application at various levels, namely universities, high schools, and elementary schools. This shows that at the elementary level, the application of learning with Mic. Teams is still small or its nature is still in its infancy. Therefore, research needs to be done to describe 1) Mic-based e-learning planning. Teams on science online learning in Elementary School 2) implementation of Mic-based e-learning. Teams on online learning science in elementary schools 3) evaluation of Mic-based e-learning. Teams on science online learning in Elementary School

RESEARCH METHODS

This research approach is qualitative, with descriptive method. The object of the research is the implementation of Mic.Teams-based E-Learning in Science Online Learning in Elementary Schools. The research subjects were 26 students of Class VI consisting of 15 boys and 11 girls. Their average age is 11 years Research Place at SDN 1 Wonogiri. Research time is semester 1 of the 2021/2022 academic year.

Data were collected by interview and observation. Interviews were conducted based on the focus of the research that had been made. Interviews were conducted with the Principal of SDN 1 Wonogiri and class VI teachers to obtain information about the implementation of Mic.Teams-based E-Learning in Science Online Learning. There are 6 items of questions asked While the observation is to observe the implementation of Mic.Teams-based E-Learning in Science Online Learning. This research was conducted using interactive data analysis techniques, namely data reduction, data presentation, and drawing conclusions (Miles & Huberman, 1992). While the validity of the data with triangulation techniques and sources. Triangulation technique is a technique that is carried out using various techniques. Source triangulation is done by checking the data that has been obtained from several sources.

RESEARCH RESULT AND DISCUSSION

Mic.Teams based e-learning planning on science online learning in Elementary School

In the interview, the Principal of SDN 1 Wonogiri (Mr. Mahmud Yunus, S.Pd) explained that Learning planning with a distance model using Mic.Teams at SDN 1 Wonogiri is carried out systematically by the school and teachers, especially classroom teachers in the Thematic Learning Content of Science Lessons. The principal also explained that in support of this policy, the school formed the IT E-Learning teams and its programs. At the planning stage of using Mic.Teams, the Principal enrolled all teachers and students for an office 365 account in order to log in and access the Mic application. Teams. The school's efforts paid off, with the success of teachers and students getting an Office 365 account so that the Mic. Teams is ready to be used as an online learning medium at

SDN 1 Wonogiri so that students can understand the material easily. According to opinion(Diana, 2020) that the learning process using Microsoft Teams makes it easier for students to understand the material.

In addition to planning in online media by the school, teachers also do planning. Based on the results of interviews with the sixth grade teacher (Ms. Agnes Rini Widiyatmi, S.Pd) explained that the teacher prepared distance learning tools in the form of syllabus, prota, promissory note, lesson plans, teaching materials, assessment programs and LKPD. The online learning implementation plan (RPP) compiled by the teacher consists of identity, core competencies, basic competencies, materials, learning objectives, steps, learning media, teaching materials, and assessments(Sartika & Susanti, 2019). According to Princess et al.,(2021)The teacher prepares the LKPD first which is used for teaching. In addition to lesson plans and LKPD, teachers also prepare teaching materials in the form of learning videos taken from You Tube. The teacher prepares the material to be taught to students in class from the student book. In addition, the teacher also prepares material from other than books. In line with Dwi Puji Astuti, Arifin Muslim. (2020) stated that the teacher collects material that is sourced apart from existing books as well as from Google. This is because there is only one source book/package book in schools, so teachers look for other materials so that the sources they get are not only from one source, but from other sources as well.

During preparation the teacher also learns the subject matter to be taught so that when the learning takes place the teacher has mastered the material. The Class VI teacher also explained that during this pandemic there was a reduction in the number of thematic learning hours in each meeting. In normal learning the number of hours for one time Thematic learning meetings are 4 hours of lessons, but during the distance learning pandemic, the number of hours of lessons is reduced to 2 hours of lessons in each meeting. In accordance with the government's policy on the emergency curriculum which is a simplification of the national curriculum. Basically, the emergency curriculum is more flexible with a reduction in basic competencies for each subject so that teachers and students can focus on essential competencies and prerequisite competencies for continued learning at the next level.(MoEC, 2020). This shows that the government's policy has forced schools to implement an emergency curriculum during the COVID-19 pandemic. Thus, learning that takes place during the COVID-19 pandemic is carried out by reducing the hours of learning. However, it does not reduce the effectiveness of learning activities.

Implementation of Mic.Teams based e-learning on science online learning in Elementary School

Based on the results of interviews with the Principal, the Mic Application was explained. Teams is used as a distance learning medium during the covid 19 pandemic by teachers and students at SDN 1 Wonogiri with the aim of providing convenience, order and coordination during the distance learning process. In addition, with the use of Mic. Teams The continuity of the learning process between teachers and students can be monitored by the Principal. All teachers at SDN 1 Wonogiri use the Mic application. Teams in learning, including Class VI teachers in the Thematic lessons of science content.

Based on the results of interviews with Class VI teachers, it was explained that face-to-face learning activities online were carried out by entering the Mic. Teams. But previously the teacher had created a Maya Class and included members in the created class. Maya class consists of teachers and all students in class VI, totaling 26 students. In the Maya Class there are several features that can be used for learning activities. These features include online meetings/online meetings, posts and tasks. To conduct an online meeting is done with an online meeting. In these activities, the teacher can convey the material directly in audio-visual. As presented in the following figure:

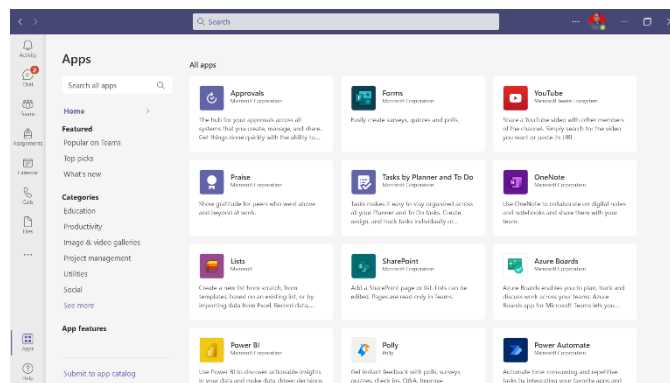


Figure 1. The features in the Mic. Teams

Based on the results of observations, meeting activities began with making an online meeting schedule by the teacher on the calendar in Microsoft Teams. On the day and time specified according to the online meeting schedule, the teacher distributes the meeting link/meeting link to students through the Class VI WhatsApp Group, making it easier for students to join the specified online meeting. In the online meeting activities held, the number of class VI students who participated and joined were 25 out of 26 students or 96%. This means that the majority of students can participate in these activities. With many students who are enthusiastic and participate in these activities, it means that the learning process through the online system in class VI can run smoothly. Before using online meetings, students only asked questions via chat in WhatsApp groups,

In addition to online meeting activities, on the VI virtual class homepage there is also a posting menu. In this menu the teacher can convey material in the form of writing, photos, or videos. Even more interesting, in the post menu, the material can be directly connected to the youtube link. Making it easier for educators to present quality material according to the theme being taught through youtube links. Likewise, students' insight into learning materials is getting wider. At the time of the study, the teacher presented Vegetative Plant Reproduction using the Mic application. Teams. For the deepening of the material, the teacher carries out practice-based learning activities through the assignment feature. Students observe the plants around where they live and then classify the types of reproduction.

The results of the observations are reported and sent through the assignment feature along with documentation (photos) of their activities. With practice-based science learning, students can carry out activities that can deepen the material and develop their potential. In addition, so that students are not bored in online learning. According to opinion(Winangun, 2021) with a simple practicum is able to provide new learning nuances to students so as to eliminate students' boredom with the monotonous online learning system. Thus, practical learning can make students enthusiastic in learning and eliminate their boredom.

The following are the results of the learning screenshot using the Mic application. Teams. In Class VI SDN 1 Wonogiri:

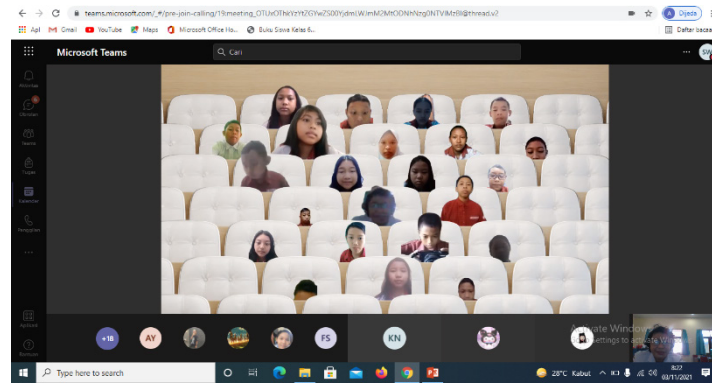


Figure 2. Teachers and students can have virtual meetings

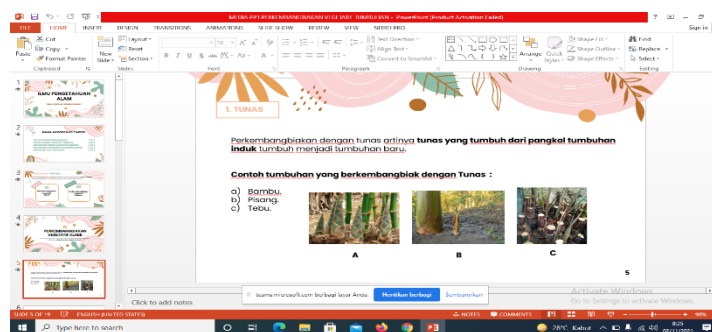


Figure 3. Teachers can share screen material and students can immediately see the show

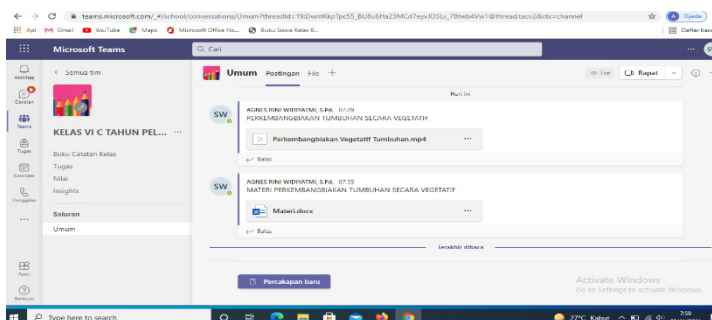


Figure 4. Teachers can send material on the Posts menu feature

Mic.Teams based e-learning evaluation on science online learning in Elementary School

Based on the results of interviews with the principal, it was explained that the evaluation of learning using the Mic.Teams application at SDN 1 Wonogiri was carried out every month. Usually on the last week of every month. Learning evaluation is adjusted to the learning objectives. Based on the result of interviews with the teacher, it was explained that the evaluation used by the teacher includes 3 assessment domains, namely cognitive, affective, and psychomotor.

1. Cognitive Domain,

This assessment of the cognitive domain aims to measure the mastery of basic scientific concepts (content objects) in the form of essential materials as key concepts and main principles. This is as stated by Rosyidi.(2020) that this cognitive domain is a domain that involves more mental/brain activities. In this realm, the teacher assesses through questions using a test technique in the form of a HOTS Essay with a total of 10 questions. The questions made refer to Basic Competencies or KD 3.1 IPA (vegetative propagation of plants).HOTS is the highest thinking ability compared

to just memorizing or retelling. HOTS is very important for teachers. According to research results (Rozi & Hanum, 2019) To realize 21st century learning and HOTS, teachers must have good process skills in learning. Cognitive learning outcomes of students with the application of Mic.Teams can be shown as in Table 1.

Table 1. Student Learning Outcomes

| Data | Learning outcomes |
|-------------------|-------------------|
| | Cognitive |
| The highest score | 90 |
| Lowest Value | 60 |
| Completeness | 85 |
| Average | 79 |
| Category | Well |

Based on table 1, it is known that the average value of student learning outcomes is 79 with the details of students who get a score of ≤ 75 totaling 4 people and students who get a score \geq of 75 totaling 22 people, so it can be categorized that 85% of students achieve KKM / Complete scores, while 15% of students have not achieved the KKM score / have not completed. Learning outcomes are categorized as good because they have reached 85% completeness. Students work on questions in the form of essays.

2. Affective Domain,

In this realm the teacher assesses through discipline in sending assignments. Students need to be disciplined so that the assignments given by the teacher can be done and collected according to the time given. According to research Purwanti E, (2020) Student discipline in schools grows because teachers make class rules, give additional grades to students who are quick to do assignments, and make class picket schedules. Discipline assessment uses observation techniques. Discipline indicators assessed are obeying class rules, doing assignments well, submitting assignments on time. The results of the interview with the sixth grade teacher at the end of the learning activity the teacher gave assignments through the task menu. Students just upload their answers on the menu. Educators can immediately correct answers from students and can immediately provide grades. Likewise, students can also immediately see the value of the results of their work after being corrected and rated by the teacher.

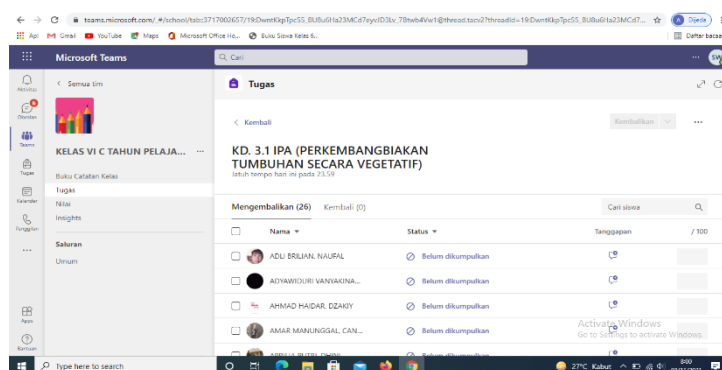


Figure 5. Teachers can give assignments on the task menu

Based on the results of observations, the student's response to the completion of the tasks given by the teacher was quite good. Student responses to the assignments given by the teacher vary,

there are students who are given assignments immediately and sent to Mic.Teams, there are also those who only see that their assignments are not immediately done and sent, although on the deadline for collecting, there are also those who are late in sending. Duty. To motivate students, the teacher provides additional value rewards for those who submit assignments on time, the teacher also always reminds students who have not submitted assignments. Discipline students are 19 students and there are 7 students who are not disciplined in working on assignments.

3. Psychomotor Domain,

This learning outcome is a domain related to skills or the ability to act after a person receives a certain learning experience. In this realm the teacher assesses through practice in the form of videos. Psychomotor learning outcomes are a continuation of cognitive and affective learning outcomes. This will be possible after students show certain behaviors or actions in accordance with the meanings contained in these two domains in everyday life. The psychomotor assessment technique carried out is with instrument. The indicators used are valid, reliable, and practical. The instrument can be used for psychomotor competency assessment. According to research results Fuadi et al., (2015), it was concluded that the competency-based PAP (Psychomotor Aspect Assessment) - IPA instrument for green plant material was feasible and could increase the mastery of psychomotor competence.

Psychomotor assessment in Mic.Teams learning has been carried out well. By learning through this media the teacher can provide an explanation of the procedures for implementing practical activities that will be carried out by students, namely by observing plant species. After carrying out these practical activities, students send videos of the results of their activities through Mic. Teams. Of course, with these practical activities, it is hoped that it can generate motivation to learn science, develop basic skills in carrying out experiments, become a vehicle for learning scientific approaches and as a support in understanding subject matter.

Learning through Mic. Teams is already based on a science process. According to research conducted by Firdaus & Subekti.(2021) that student interest in online learning is in the very interested category so that Microsoft Teams media is well used in the learning process.

CONCLUSION

Based on the results of research that has outlined, then can conclusion drawn as follows.

1. Mic. Teams based e-learning planning on science online learning at SDN 1 Wonogiri carried out systematically by the school and teachers. This is realized by the policy of the principal by forming the PJJ IT team and its programs and registering all teachers and students to get an office 365 account so they can enter and access the Mic application. Teams. Teachers also prepare distance learning tools in the form of syllabus, prota, promissory notes, lesson plans, teaching materials, assessment programs and LKPD.
2. Implementation of Mic.Teams based e-learning on science online learning at SDN 1 Wonogiri Beginning with the teacher creating a Virtual Class and including members in the created class. In this virtual class, there are several features that can be used, including online meetings/online meetings, posts and assignments. To conduct an online meeting is done with an online meeting. At the online meeting held, the number of class VI students who participated and joined was 25 students or 96%. On the VI virtual class homepage there is also a post menu. In this menu the teacher can convey material in the form of writing, photos, or videos. At the end of the online learning activity, the teacher gives assignments through the task menu.
3. Mic.Teams based e-learning evaluation on science online learning at SDN 1 Wonogiri is carried out every month. Usually on the last week of every month. What is evaluated in this activity is the cognitive, affective and psychomotor domains. The implications of this research can be used as a reference and foothold in conducting learning with Mic-based IPA E-Learning media.

Teams. Suggestions for Mic users. Teams to better master the existing features so that they can do Mic.Teams-based learning optimally.

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Study of Student Self-Efficacy in Online Learning in the Era of the Covid-19 Pandemic

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ABSTRACT

The purpose of this study was to examine student self-efficacy in online learning in the era of the Covid-19 pandemic. This research is a quantitative research through survey method. The population and sample are students majoring in Geography Education, FKIP, Unsil class 2018, 2019, and 2020 with a total of 200 students. Data collection is distributed through google form. The research instrument used a Likert scale which was distributed in each answer to the questions in the questionnaire. Data analysis used quantitative descriptive analysis with percentages. The results of the study on the self-efficacy scale, namely 63.5% moderate level, 29.5% low level and 7% high level. Analysis of student self-efficacy is studied based on the dimensions of self-efficacy, namely the magnitude dimension shows students have a high enough level of optimism in conducting lectures and completing tasks given by the lecturer in charge of the course, the strength dimension shows students believe and know the advantages that exist within them so that they are able to carry out all activities in lectures as a form of development and hone their potential, the generality dimension shows students have the ability to solve their problems but some problems may need the help of others in solving them. Students' self-efficacy in conducting Distance Learning during the covid pandemic is on average still in the moderate category. This means that students already have sufficient self-efficacy but still need to get supportive motivation.

Keywords: *self-efficacy, online learning*

INTRODUCTION

Distance Lectures conducted by students and lecturers have been going on for almost 2 years during the covid-19 pandemic. Distance learning activities are carried out to limit the spread of Covid-19 in the university environment. During the pandemic, lecture activities mostly use the help of various online-based learning technologies (Widiyono, 2020). This condition is also experienced by students at the Department of Geography Education, FKIP, Siliwangi University.

Students as human learners have the same responsibility to take distance courses. But on the other hand, students as individuals have various perceptions regarding online lectures. A study conducted by Ningsih (2020) shows that most students prefer face-to-face learning in class. This is in accordance with the results of initial interviews in the field with level students who want lectures to be conducted face-to-face in class. In line with the study conducted by Rahmatih and Fauzi (2019) that students will be much more free and open when discussing face-to-face with lecturers.

Students said that while doing Distance Learning, they experienced many challenges and problems. Directly or indirectly, these problems can have an impact on the achievement of learning outcomes. The challenge currently encountered by most students is starting to feel bored with distance learning activities. This is because more often lectures are conducted through zoom meetings. Monotonous Distance Lecture activities using zoom meetings cause students to feel bored and become less focused on the lectures being carried out (Widodo and Nursaptini, 2020).

Another study conducted by Pardede (2020) showed that students also had difficulty understanding lecture material. This is because the delivery has not run optimally through the online media used. Furthermore, regarding the collection of assignments, students tend to be not on time and some even do not complete the assignments given (Rahmawati and Putri, 2020). Thus lectures become hampered and student learning outcomes become less than optimal.

Distance learning conditions experienced by students need to be understood as a response to students' self-confidence in what they understand and what they can do. Good belief in their own abilities gives them the opportunity to do what they want to achieve to the fullest. This condition is known as self-efficacy which has an impact on a person's confidence to successfully do something or achieve the desired goal. Thus, in the context of learning, self-efficacy understanding of students is needed to achieve the current success of Distance Learning and further achieve their dreams.

Grenner, et al (2021) asserted that self-efficacy is an individual's assessment of his abilities/potential to succeed in one field or achieve certain goals. Furthermore, in academic activities by Bandura, et al (Ormrod, 2008) it is explained that academic self-efficacy can affect the selection of activities, goals, efforts and perseverance of students in carrying out various activities in class. The same thing was conveyed by Hergenham and Olson (Mukti & Tentama, 2019) suggesting that academic efficacy is related to a student's belief about his or her own abilities and ability to succeed in carrying out the academic tasks assigned to him.

Bandura (Hendriana, et.al., 2018:213) describes 3 indicators that can be used to observe the self-efficacy of a learner in this study, namely students. The first self-efficacy indicator, namely the magnitude dimension, is how students can fill their learning difficulties which include: 1) having an optimistic view in doing lessons and assignments; 2) how much interest in lessons and assignments; 3) develop abilities and achievements; 4) see a difficult task as a challenge; 5) study according to a set schedule; 6) act selectively in achieving goals.

The second dimension, namely the strength dimension, is how high the confidence of students in overcoming their learning difficulties, which includes: 1) the efforts made can improve achievement well; 2) commitment in completing the assigned tasks; 3) believe and know the advantages they have; 4) persistence in completing tasks; 5) have a positive purpose in doing things; 6) have a good self-motivation for self-development.

The third dimension, namely the generality dimension, shows whether self-efficacy beliefs will take place in a certain domain or apply in various kinds of activities and situations which include: 1) responding to different situations well and thinking positively; 2) make past experiences as a way to achieve success; 3) likes to look for new situations; 4) can handle all situations effectively; and 5) try new challenges.

Based on these findings, it is necessary to conduct research on «Student Self-Efficacy Studies in Online Learning in the Era of the Covid-19 Pandemic».

METHODS

This research is quantitative research through survey method. According to Creswell (2015: 752), survey research is «a procedure in quantitative research where research administers a survey on a sample or on an entire population of people to describe attitudes, opinions, behaviors or specific characteristics of the population». The population and sample in this study were students majoring in Geography Education, FKIP, Siliwangi University which consisted of 3 batches, namely the 2018 class, 2019 and 2020, totaling 200 students, namely those who did Distance Lectures. The data collection in this study was taken from the answers to the questionnaires distributed through the google form. This research instrument uses a Likert scale which is distributed in each answer to the questions in the questionnaire to determine the attitudes, opinions and perceptions of students regarding their self-efficacy through various questions submitted in the questionnaire. The Likert scale in this study used a measure with five ratings, namely Strongly Agree (SS), Agree (S), Neutral (N), Disagree (TS), Strongly Disagree (STS). For more details can be seen in table 1.1 below.

Table 2 Criteria for Alternative Weighting Answers

| Alternative answer choices | Positive Question Weight | Negative Question Weight |
|----------------------------|--------------------------|--------------------------|
| Sangat Setuju (SS) | 5 | 1 |
| Setuju (S) | 4 | 2 |
| Netral (N) | 3 | 3 |
| Tidak Setuju (TS) | 2 | 4 |
| Sangat Tidak Setuju (STS) | 1 | 5 |

Riduwan and Akadon (2015:16)

The above instrument was used with several adjustments regarding the alternative answers and their weights became:

Table 3 Criteria for Alternative Weighting Answers

| ANGKA | KRITERIA JAWABAN |
|-------|---------------------------|
| 4 | SS = SANGAT SESUAI |
| 3 | S = SESUAI DENGAN |
| 2 | TS = TIDAK SESUAI |
| 1 | STS = SANGAT TIDAK SESUAI |

Furthermore, the instrument needs to be tested for feasibility which consists of validity and reliability tests to ensure that the instrument used is valid and reliable. Data analysis was carried out in a quantitative descriptive manner with percentages so that conclusions could be found about students' self-efficacy in online learning.

RESULT AND DISCUSSION

Result

The results showed that there were 200 responses from respondents consisting of 141 (70.5%) female students and 59 (29.5%) male students. Respondents came from different batches, namely 5 people (2.5%) from the 2018 batch, 85 people (42.5%) from the 2019 batch, and 108 people (55%) from the 2020 class. Answers related to the student self-efficacy scale showed various responses. There are 26 indicators asked in the self-efficacy scale questionnaire with the following results.

The 1st data is the statement «By trying I can do a very difficult task», the results of the study show responses related to the statement, namely 53.5% stated Very Appropriate, 43.5% stated In accordance with, and 3% stated Disagree. The second data is the statement «I don't like to do a lot of activities because I am afraid the results are not optimal», the results of the study show responses related to the statement, namely 40.5% stated Disagree, 38.5% stated In accordance with, 11.5% stated Strongly Disagree. Appropriate and 9.5% Very Appropriate. The third data is the statement «Online Mid-Semester Examination is indeed difficult but I am sure I will pass», the results of the study show responses related to this statement, namely 56% stated Very Appropriate, 40% stated In Accordance With and 4% stated Not Appropriate.

The 4th data is the statement «I have no difficulty in carrying out my intentions and goals», the results of the study show responses related to the statement, namely 45.5% stated Disagree, 39.5% stated In accordance with, 9.5% stated Very Appropriate and 5.5% stated Strongly Not Appropriate. The 5th data is the statement «Each task has a different level of difficulty, I believe I can do it well», the results of the study show responses related to the statement, namely 51.5% stated In accordance with, 46.5% stated Very Appropriate and 2% stated It is not in accordance with. The 6th data is the statement «Mid-semester exams make me feel worried», the results of the study showed responses

related to the statement, namely 46.5% stated In accordance with, 29.5% stated Disagree, 16% stated Very Appropriate and 8% stated Very It is not in accordance with.

The 7th data is the statement «No matter how hard I try the exam is still a difficult thing to do», the results of the study show responses related to the statement, namely 41.5% stated Disagree, 34.5% stated In accordance with, 12.5% stated Very Not Appropriate and 11.5% stated Very Appropriate. The 8th data is the statement «I choose to keep learning regardless of the results», the results of the study show responses related to the statement, namely 54% stated Very Appropriate, 40% stated In Accordance With and 6% stated Disagree. The 9th data is the statement «No matter how hard I try, I still can't understand the difficult lecture material», the results of the study show responses related to the statement, namely 47% stated Disagree, 25% stated In accordance with, 19.5% stated Very Not Appropriate and 8.5% stated Very Appropriate.

The 10th data is the statement «Mid-Semester Examination is something difficult, therefore I am not sure I will pass», the results of the study showed responses related to the statement, namely 54.5% stated Very Inappropriate, 35% stated Not Appropriate, 6.5 % stated In accordance with and 4% stated Very Appropriate. The 11th data is the statement «I feel I can do a task that has been done before», the results of the study show responses related to the statement, namely 57.5% stated In accordance with, 35% stated Very Appropriate, 5.5% stated Not In accordance and 2% declared Strongly Inappropriate. The 12th data is the statement «By doing a lot of activities makes my time less», the results of the study showed responses related to the statement, namely 36.5% stated In accordance with, 34% stated Disagree, 15.5% stated Very Appropriate and 14% stated Very Incompatible.

The 13th data is the statement «More and more tasks make me feel dizzy», the results of the study showed responses related to the statement, namely 44.5% stated In accordance with, 43% stated Very Appropriate, 10% stated Disagree and 2.5% stated Very It is not in accordance with. The 14th data is the statement «I will ask the lecturer if I can't complete the given task», the results of the study show responses related to the statement, namely 55.5% stated In accordance with, 25% stated Not In accordance, 15% stated Very Appropriate and 4.5% stated Strongly Not Appropriate. The 15th data is the statement «I feel I am only able to do one task only», the results of the study show responses related to the statement, namely 52% stated Not Appropriate, 25% stated Very Disagree, 19.5% stated In Accordance with and 3.5% declared Very Appropriate.

The 16th data is the statement «I only do what I want to do», the results of the study show responses related to the statement, namely 36% stated In accordance with, 32% stated Not In accordance, 22.5% stated Very Appropriate and 9.5% stated Very Incompatible. The 17th data is the statement «I feel that I don't need to learn things that are difficult to do», the results of the study show responses related to the statement, namely 51.5% stated Not Appropriate, 32% stated Strongly Disagree, 13% stated In accordance with and 3.5% stated Very Appropriate. The 18th data is a statement that I feel happy with easy things, so I am lazy to do difficult things», the results of the study showed responses related to the statement, namely 45% stated Disagree, 33% stated In accordance with, 14% stated Very Disagree. and 8% stated Very Appropriate.

The 19th data is the statement «With the efforts made to make sure I can pass in all courses», the results of the study show responses related to the statement, namely 63.5% stated Very Appropriate, 32% stated In Accordance With and 4.5% stated No In accordance. The 20th data is the statement «I am always motivated to always believe and believe in existing abilities», the results of the study show responses related to this statement, namely 62% stated Very Appropriate, 32.5% stated In Accordance With and 5.5% stated Disagree . The 21st data is the statement «I believe I passed all the courses because I feel confident in my abilities», the results of the study show responses related to this statement, namely 53.5% stated Very Appropriate, 39% stated In Accordance With, 7% stated Not Appropriate and 0.5% stated Strongly Not Appropriate.

The 22nd data is the statement «I find it difficult to motivate myself to be able to study hard», the results of the study show responses related to the statement, namely 42.5% stated In accordance

with, 29% stated Disagree, 22.5% stated Very Appropriate and 6% declared Strongly Inappropriate. The 23rd data is the statement «I always ask for help from other people in solving the problems that I experience», the results of the study show responses related to the statement, namely 50% stated In accordance with, 35% stated Disagree, 9.5% stated Very Appropriate and 5.5% stated Strongly Not Appropriate. The 24th data is the statement «I always avoid being given a task because I feel I can't complete it», the results of the study show responses related to the statement, namely 46.5% stated Strongly Not Consistent, 46% stated Incompatible, 6.5% stated In accordance with and 1% answered Very Appropriate.

The 25th data is the statement «I can still solve the problem even though the problem has never been experienced before», the results of the study show responses related to the statement, namely 57% stated In accordance with, 35.5% stated Very Appropriate, 6% stated Not In accordance and 1.5% stated Strongly Not Appropriate. The 26th data is the statement «I will find a way out and continue it, if someone hinders my goals», the results of the study show responses related to the statement, namely 53% stated Very Appropriate, 44.5% stated In Accordance With, 1.5% stated No Appropriate and 1% stated Strongly Disagree.

Furthermore, the results of individual self-efficacy research are processed to determine the level of self-efficacy of each individual. The results of data processing showed that there were 63.5% with moderate levels of self-efficacy, 29.5% with low levels of self-efficacy and 7% with high levels of self-efficacy. Students have various characteristics and there are also various factors that affect the value of self-efficacy. Therefore, it needs to be studied more deeply in the discussion section.

Discussion

Based on the results of the study, students' self-efficacy was more dominant in the moderate category, namely 63.5%. The low self-efficacy category based on the results of the study was 29.5% and the high self-efficacy category was 7%. The low self-efficacy category has a higher percentage than the high self-efficacy category. This shows that the average student has sufficient self-efficacy, namely there is a moderate category. Bandura (Schunk, 2012) states that «Self-efficacy refers to a person's beliefs about his abilities to learn or take actions at specified levels.» Self-efficacy helps students to be able to determine what they will do with their knowledge and skills in order to get the expected results.

There are three indicators for measuring self-efficacy according to Bandura (Hendriana, et.al., 2018:213), namely the dimensions of magnitude, strength and generality. The magnitude dimension relates to how students fill their learning difficulties. The results showed that the achievement of the magnitude dimension was one of them, namely 98% of students stated that they were optimistic that they could do the task well even though each task given had a different level of difficulty. This is evidenced by student statements, namely there are 92.5% of students who do not avoid being given assignments because 94% of students still choose to study regardless of the results. This shows that on average, students have a fairly high level of optimism in conducting lectures and completing the tasks assigned by the course lecturers.

The strength dimension relates to how high students' confidence in overcoming their learning difficulties. The results showed that the achievement of the strength dimension was one of them, namely 97% of students showed persistence to do very difficult tasks by trying. In addition, 66% of students stated that they could understand the lecture material with their efforts and 83.5% had high motivation and confidence in doing difficult things. This is also in line with the results which showed that 92.5% of students stated that they were always motivated to believe and believe in their abilities so that it gave rise to confidence in 92.5% of students to be able to pass all courses. This shows that students believe and know the advantages that exist within themselves. Thus they are able to carry out all activities in lectures as a form of development and hone their potential.

The generality dimension shows whether self-efficacy beliefs will take place in a particular domain or apply in a variety of activities and situations. The results showed that the achievement

of the generality dimension was one of them, namely 92% of students stated that they could solve problems that had never been experienced before. Most of them prefer to ask for help from other people in solving their problems, namely 59.5 students said so. This shows that students have the ability to solve their problems but for some problems they may need the help of others to solve them. This is as stated by 35% of students who feel some do not need to ask others for help.

The students' self-efficacy dominantly reached the moderate/moderate category, but the results of the study found that there were students with high and low levels of self-efficacy. If we look more closely, the low category has a higher percentage than the high category. This means that there are still students with low self-efficacy and few students with high self-efficacy. This can be an interesting study where students with high self-efficacy can have a positive influence on students with moderate and low self-efficacy. However, this can also be a challenge if the distance learning environment that is formed is not in favor of students with high learning efficacy. Therefore, support from lecturers is needed to create a learning environment that supports increasing student self-efficacy.

CONCLUSION

Based on the presentation of the discussion, it can be concluded that students' self-efficacy in conducting Distance Learning during the covid pandemic is still in the average category. This means that students already have sufficient self-efficacy but still need to get supportive motivation. The motivation can come from the family environment, peers in this case friends who are in the same class as the student and motivation from academic assistant lecturers. This is necessary in order to help students understand themselves, their potential and be able to provide solutions to problems faced during Distance Learning. In addition, further research is needed to examine more deeply the self-efficacy of students who have different characteristics and dynamic conditions.

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Education of Social Intelligence and Environmental Talents Based on Material and Vital Values in Quran Translation Text

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ABSTRACT

This study examined material and vital values in Quran translated text (Indonesian) containing the word *langit* (sky, heaven), namely: (1) analyzing the material value and its role in educating the talents of social intelligence, and (2) examining the vital value and its role in educating environmental intelligence talent. This research utilized descriptive qualitative approach. Data collection used observation and documentation techniques. Data analysis was carried out using referential identity method. The results of the analysis of material values are of two kinds: (1) invitation material values and (2) prohibition material values. The material value of invitation included invitations to: (a) act to protect oneself from danger, (a) ask forgiveness from Allah, (c) be pious. The material value of prohibition includes the prohibition of: (a) being stingy, (b) saying falsities about Allah, (c) breaking the limits of religion. Material values that educate social intelligence talents included: (a) being a generous human being, (b) behaving naturally, not extreme, (c) seeking and studying science, especially religious knowledge. The vital values found in the study included: (1) it is God who made the earth as an expanse and the sky as a roof, rains down, gives fruit and sustenance to humans, (2) all processes from raining water, growing trees, bearing fruit, to maturity were done by Allah, (3) Allah is All-Knowing. These vital values educate the talents of environmental intelligence: (1) sustenance is not solely due to human efforts, but also because of Allah, (2) humans are obliged to manage natural resources and all of their contents to meet the needs of all of Allah's creatures, (3) human knowledge to manage it is part of Allah's knowledge.

Keywords: material value, vital value, social intelligence talent, environmental intelligence talent

INTRODUCTION

The Holy Quran is the word of Allah (God), which contains various instructions for humans to live life. In living life, humans are faced with various problems whose answers are in the Quran. To facilitate the search for answers, Asyari & Rosyi Yusuf [1] compiled a book containing a list of words, terms, expressions, etc that may serve as keywords. One of the words/terms that can be traced in the Quran is *langit* (sky, heaven). This word is found in 77 chapters and spread over 305 verses.

Many studies related to the Quran have been carried out. However, in Quran 18:109 and 31:27, it is stated that the breadth of Allah's knowledge is infinite. That is, no matter how much research on the Quran, it is not comparable to the knowledge of Allah. There is still a lot of God's knowledge contained in the Quran that must be studied.

The urgency of this research can be explained below. The Quran contains guidance and knowledge. As a guide, the Quran must be implemented as a way of life. To be able to carry out the instructions, the meaning and contents of the instructions in the Quran must be studied and understood. By understanding the meanings of the instructions, it can become a guide for how Muslims should respond to all things contained in the verses; including ones that contain the word *langit* (sky, heaven) as studied in this paper, especially related to the talents of social and environmental intelligence. The results of this study serve as guidelines in educating social and environmental intelligence talents.

Several studies on Quran translation text have been carried out. They can be classified into two major groups, namely research in the field of linguistics and research outside of language. First, research covered in the field of linguistics and its branches included: (1) language politeness in Quran [2], (2) alignment of functions, categories, and roles in Quran [3]. In addition, (3) adverbs in Quran translation text have also been investigated, especially adverbs of aspect markers, disclaimers, and modality markers [4], [5], [6], [7]. Second group, research on Quran outside the field of linguistics that has been carried out included: (1) the character of Prophets in the Quran by Markhamah, et al. [8], [9]. Several studies have also been carried out regarding gender in the Quran. The studies referred to included (2) a study on gender in the Quran conducted by Aziz [10], and (3) Maslamah [11] and several thematic studies related to environmental conservation, benevolence, grace and affection, and others which are described in the following sections.

Mauluddin studied the meaning of the word *hujan* (rain) in the Quran with the interpretation of Ibn Katsir, Quraish Shihab, and Hamka using the comparative method [12], by conducting a semantic and stylistic study of the word. The results of this study indicated that in the Quran there are 73 data that reveal the meaning of the word. Thematic studies of certain words were also carried out by previous researchers [13], and [14].

In addition to the word *hujan* (rain), there is also a word of *rahmat* (grace) that was studied. Grace is love from Allah which is bestowed on all His creatures without exception. There are four dimensions of grace. The dimensions in question are: universal, continuity of human generation, faith and knowledge, attitudes and interactions between groups [15]. Regarding the use of words, Badruzaman's conclusion stated that the speech used is good and appropriate, where and whenever it is used, does not offend, is fair, the words chosen are gentle, and considers the level of intelligence [16].

Studies which both subject and object are in the Quran have also been carried out, including on natural intelligence [17]; [18], ecological education in an Islamic perspective [19], and Quranic insight on nature conservation [20], [21], and [22].

Several other studies on the Quran have also been carried out by several researchers, such as Hoffmann, Campanini, Abdullah, Bevilacqua, and Jan Loop. Hoffmann examined the pragmatic and functionalistic nature of the Quranic rhetoric [23]. Campanini focused on exploring the role of language in understanding the Quranic idea of God in relation to philosophical topics such as ontology and epistemology [24]. Bevilacqua and Loop stated that the study of the Quran helped generate a new comparative concept: namely the scriptures of lowercase and plural letters [25].

Based on these various studies, it can be shown that the study of the Quran in various perspectives has been carried out, both from a very general perspective, and in a special perspective, such as linguistics. However, specific studies related to social values regarding verses that contain the word *langit* (sky, heaven) in Quran have not been found. This study focused on the material and vital values namely: (1) what material values and their roles in educating social intelligence talents are, and (2) what vital values and their roles in educating environmental intelligence talents are.

METHOD OF RESEARCH

This research utilized a descriptive qualitative approach [26]; [27]; [28]). Data collection was performed with observation and documentation techniques [29]; [30]).

The application of the documentation method was carried out by analyzing documents in the form of chapters and verses of the Quran, in 77 letters and 305 verses where the word *langit* (sky, heaven) is found. The observation method is a data collection method that is carried out by observing the use of language on the object under study [31]. What was observed was the Quran, with the help of Asyari & Rosyi Yusuf Index Book [1]. Due to the breadth of the Quran, the researcher limits the material value and vital value to the text containing the word *langit* (sky, heaven).

Data analysis was carried out using the referential identity method, namely data analysis whose tools are outside, apart, and not part of the language in question [31]. This method is used to identify and analyze vital values and material values in lingual units of texts containing the word *langit*.

RESULTS AND DISCUSSION

Social value is a concept that exists in everyone which is used as the truth and as a standard to behave in a democratic and harmonious social life [32].

According to Notonagoro, social values consist of material values, vital values, and spiritual values [33]. Material values, namely values related to invitations and prohibitions, to do good that is beneficial to the human body and stay away from bad deeds that are not beneficial to the human body. Vital values are values related to knowledge and skills. Spiritual values include the value of truth, the value of beauty, and the value of goodness. The value of truth comes from the human mind. The benefit of this value is to find the truth that is in accordance with reason and feelings or conscience related to good and bad. In addition to reason, the value of truth can be found from sources of religious guidelines, such as Quran, Bible, Torah, and Zabur [33]. The value of beauty (aesthetics) emphasizes taste and art. This value is one of the elements of culture, namely the art of music, dance, etc. The value of goodness, is a value that comes from various things such as the will, intention, heart, and human instincts. The benefits of this value are used to educate matters relating to actions, attitudes, rights, obligations, etc. The value of divinity, is an absolute value which is a belief in God. The source of this value is religion. This value is related to the relationship between humans-God, between humans, and humans-environment.

Material Values in Quran Translation Text

Material values are values related to invitations and prohibitions, to do good that is beneficial to the human body and stay away from bad actions that are not beneficial to the human body. Based on the analysis of the material values contained in the Quran translation text containing the word *langit* (sky, heaven), the values are grouped into two, namely material values related to the invitation to do good which is beneficial for the human body and the prohibition to do bad, which is not beneficial to the human wellbeing.

Material Values Related to Invitations to Do Good and Educating Social Intelligence Talents

In Quran translation text there is a material value involving humans plugging their ears with their fingers, (to avoid) the sound of lightning for fear of death (Al-Baqarah 2:19).

Atau seperti (orang yang ditimpa) hujan dari langit, yang disertai kegelapan, petir, dan kilat. Mereka menyumbat telinga dengan jari-jarinya, (menghindari) suara petir itu karena takut mati. Allah meliputi orang-orang yang kafir (Al-Baqarah 2:19).

Or like (those who are struck by) rain from the sky, accompanied by darkness, thunder and lightning. They plug their ears with their fingers, (avoid) the sound of thunder for fear of death. Allah covers those who disbelieve (Al-Baqarah 2:19).

The ear plugging action is performed to eliminate the fear that death will befall on the human. This translation illustrates and at the same time is an invitation to act when there is lightning. This action is beneficial to the human physique, namely protecting the human ear from loud sounds that can cause damage to the ear. This needs to be done because if the sound is too loud it can cause damage to the eardrums.

The material value of plugging ears with fingers in this text serves to educate the talents of social intelligence, namely when something dangerous happens, one must do something to prevent that danger from happening. The effort depends on the danger that is coming and the ability to prevent

that danger. In addition to ability, the effort can also be influenced by the availability and need for certain equipment.

The material value in this text can provide education on social intelligence talent. Social Intelligence, according to Thorndike is the ability to understand and manage human relationships [34]. Social intelligence means people who are able to make people around them feel comfortable and relaxed with their existence. Agustian stated that social intelligence is a social ability which includes the ability to control oneself, have endurance when facing a problem, be able to control impulses, motivate oneself, be able to regulate moods, the ability to empathize and build relationships with others [35].

The next material value, is an invitation to ask forgiveness from Allah. Asking Allah for forgiveness is an act that humans need to do so that humans do not get the torment that will befall their bodies and souls. In addition to avoiding torment, humans will also get a pass to heaven. Heaven is a picture of a place that is pleasant and makes humans physically comfortable. This value is written on Ali 'Imran (3:133), which reads, "And hasten to seek forgiveness from your Lord and get a paradise as wide as the **heavens** and the earth, which is prepared for those who are pious..." (Ali 'Imran 3:133).

Education of social intelligence talents that can be done; if someone makes a mistake because he violates God's commands, he needs to ask God for forgiveness. If the mistake was made between humans, they must apologize to humans. By asking Allah for forgiveness, one is spared from Allah's punishment, which also means avoiding the pain of hell torment. By apologizing to others, it means that the guilty person has not hurt another person, if that other person has forgiven him. If we don't apologize, other people we have hurt because of our mistakes, they might retaliate against us.

The material value of invitation to piety is found in, "Isa replied: Fear Allah if you are truly a believer" (Al-Ma'idah 5:112). The material value of this invitation to piety is an invitation made by Prophet Isa to his people. This invitation, apart from fulfilling Allah's commands, is also an effort to prevent the people of Prophet Isa from being tormented by Allah. This torment is something that must be avoided because it will cause pain and discomfort to the human body.

Al-Ma'idah (5:112) describes the education of social intelligence talent to Muslims to behave socially that is beneficial to others, or to help others. This social behavior is meant to help others, so that other people do not have trouble or are not tortured by Allah because of their mistakes.

Based on the text analysis above, it can be stated that material values are the basis for education on the value of social intelligence talents.

Material Values in the Form of Prohibition of Bad Behavior and Education of Social Intelligence Talent

The material value in the form of a prohibition on doing bad things is found in Quran translation text, which is a prohibition against committing acts that exceed the limit/rule. The material value in the form of this prohibition is found in, "Do not exceed the limits in your religion, and do not say against Allah except the truth." (Annisa' 4:171). What is meant by transgressing in the context of this verse is exceeding the limit of religion, namely opposing the truth and lying. To lie in this verse is to deny the message of Jesus and make him a God besides Allah (<https://tafsirq.com/4-an-nisa/ayat-171#tafsir-quraish-shihab>, accessed August 23, 2021 at 15:53) [36]. In addition to exceeding limits in religion, in this verse there is also a prohibition against saying anything untrue about Allah.

Table 1: Findings on values of invitation and social intelligence talent education

| No. | Quran source | Invitation material value | Social intelligence talent education |
|-----|--------------------|---------------------------|---------------------------------------|
| 1. | Al-Baqarah (2:19) | Act of self protection | Avoiding danger |
| 2. | Ali 'Imran (3:133) | Apologize to Allah | Apologize to those that one did wrong |
| 3. | Al-Ma'idah (5:112) | To have obedience | Helping others |

| | | | |
|----|--|-----------------------------|--|
| 4. | Al-Ma'idah (5:114) | Invitation to pray | Pray for others |
| 5. | Al-Ma'idah (5:117) | Invitation to worship Allah | Inviting others to worship God |
| 6. | Annisa' (4:170; 171), Al-A'raf (7: 96, 158) | To have faith in Allah | Inviting others to have faith |
| 7. | Al-A'raf (7:96) | to have faith and obedience | If humans have faith and obedience, God's blessings will follow |
| 8. | Al-An'am (6:14) | To surrender to Allah | Surrendering to god will solve many issues like stress etc |

Material Values in the Form of Prohibition of Bad Behavior and Education of Social Intelligence Talent

The material value in the form of prohibition on doing bad things is found in Quran translation text, one which is a prohibition against committing acts that exceed the limit. The material value in the form of this prohibition is found in, "Do not exceed the limits in your religion, and do not say against Allah except the truth." (Annisa' 4:171). What is meant by transgressing in the context of this verse is exceeding the limit of religion, namely opposing the truth and lying. To lie in this verse is to deny the message of Jesus and make him a God besides Allah (<https://tafsirq.com/4-an-nisa/ayat-171#tafsir-quraish-shihab>, accessed August 23, 2021 at 15:53) [36] In addition to exceeding limits in religion, in this verse there is also a prohibition against saying anything untrue about God.

This material value educates social intelligence talent so that people behave naturally, not being extreme. Extreme behavior is excessive behavior. Annisa' (4:171) educates people not to do something excessively, especially to declare something against Allah. Although in this paragraph what is meant by excessive action is excessive in religion, in matters other than religion, such as social life, it should not be excessive as well.

The material value of prohibition is also found in, "and do not say, (God is) three, stop (from that speech). (That) is better for you" (Annisa' 4:171). The material value of this prohibition is the prohibition against saying that Allah is three. It can also be said that the prohibition on saying that Allah is more than one. This prohibition was said by Allah because there were people of the Book who said that Allah were three. When this prohibition is enforced, the one who will get the loss is the man who says it himself, because he will get torment from Allah.

This material value provides education for the talent of social intelligence that God is One, not three, and not numbered. This material value also provides education that one cannot arbitrarily state the nature and things about Allah that are not true, which are not in accordance with what Allah has taught or said in the Quran. In social life, people often interact with others by sharing things. In social interaction, do not say something that is forbidden by Allah.

The following material value is in the form of a prohibition on Muslims entering the group of polytheists. Al-An'am (6:14) contains a prohibition on entering the group of polytheists. That is, Muslims are prohibited from entering the polytheist group. Al-An'am (6:14) states, "and never enter the group of polytheists." The text snippet that one should never enter is a prohibition whose intensity is higher than a prohibition that does not use the word occasionally. This prohibition is said by Allah so that humans do not get torment that hurt their bodies and souls. The implication of this prohibition is that people who enter the polytheist group will get punishment from Allah.

The material value of prohibition of being a polytheist provides education for the talent of social intelligence so that in association, Muslims remain firm in their stance, not tempted to become part of the polytheist group. Satan's temptations can be done in various ways to influence Muslims to become polytheists. Temptation can be manifested in the form of material, position, women, and the like which are pleasant in the world.

The following is the material value of the prohibition against being ignorant (*jahil*). *Jahil* means 'stupid, ignorant; don't know (especially about religious teachings)' (<https://kbbi.kemdikbud.go.id/>)

entri/jahil, accessed August 24, 2021, at 13.31) [78]. In Al-An'am (6:35) there is a statement "Therefore do not be among the ignorant." The prohibition on being ignorant is issued so that humans have knowledge, especially religious knowledge.

This material value provides education for social intelligence talent on the importance of seeking and studying science, especially religious knowledge. By studying and knowing the knowledge of religion, one avoids the stupidity that causes one to easily get lost into ignorance. Religion is knowledge that comes from the Quran and hadith. Because the Quran and hadith use Arabic, in studying knowledge derived from the Quran and hadith, one needs to be assisted by teachers, scholars, and the like who understand them better.

Based on the text analysis above, it can be observed that the material value of the prohibition is the basis for educating social intelligence talents.

Table 2: Findings of prohibition values and social intelligence talent education

| No. | Quran source | Prohibition value | Social intelligence talent education |
|-----|---------------------|---|--|
| 1. | Ali 'Imran (3: 180) | Becoming stingy people | One should be generous |
| 2. | Annisa' (4:153) | Demanding the appearance of God in real | In social interaction, one should not equate the essence of God with everything in the world |
| 3. | Annisa' (4:171) | Breaking the limit of religion | behave naturally, not extreme |
| 4. | Annisa' (4:171) | Saying that Allah is three | In social interaction, one cannot arbitrarily state the nature and things about God that are not true |
| | | | Speak the truth about Allah |
| 5. | Al-An'am (6:14) | Muslims becoming polytheists | In the social environment, Muslims must be firm in their stance |
| 6. | Al-An'am (6:35) | Don't be an ignorant person | The importance of seeking and studying science, especially religious knowledge as a provision in social life |
| 7. | Al-A'raf (7:40) | Prohibition of lying about Allah's verses and self boasting | Denying Allah's verse and boasting about the coming punishment and punishment from Allah |
| 8. | Al-A'raf (7:162) | Prohibition of replacing (God's words) with other words | Replacing Allah's words with other words is an act of injustice |
| | | | In social interaction, one should not cause damage |
| 9. | Yunus (10:68) | Prohibition says that Allah has children | Humans do not have evidence about Allah having children |
| | | | In social interaction, it is inappropriate for humans to say to Allah what they do not know |

Vital Values in Quran Translation Text and Education of Environmental Intelligence Talents

Vital values are values related to knowledge and skills. The value of knowledge that can be extracted from the translation of the Quran is the knowledge of who created the heavens, the earth, and everything in them. Pay attention to the following translation.

(Dialah) yang menjadikan bumi sebagai hamparan bagimu dan langit sebagai atap, dan Dialah yang menurunkan air (hujan) dari langit, lalu Dia hasilkan dengan (hujan) itu buah-buahan sebagai rezeki untukmu. (Al-Baqarah (2:22).

(It is He who) made the earth a bed for you and the sky a roof, and it is He Who sends down water (rain) from the sky, then He produces with it (rain) fruits as a sustenance for you. (Al-Baqarah (2:22).

From the translation of Al-Baqarah (2:22), people know that it is God who made the earth as a bed and the sky as a roof. God also sends rain. With the rain, God gives fruit and sustenance to humans. It can be further understood, not only in terms of knowledge, but also from the divine, humans carry out various activities in order to seek Allah's sustenance. However, in fact it is not only because of human efforts that sustenance exists, but also because of the goodness of God.

The vital value of Allah as the All-Knowing is the vital value that is contained in, "that verily Allah knows what is in the heavens and what is on earth and that verily Allah is Knower of all things. (Al-Ma'idah 5:97). The knowledge in this verse is the knowledge that belongs to Allah. There is nothing that Allah does not know. That is, God's knowledge is knowledge of all things, both concrete and abstract. Included in this knowledge of God is the knowledge possessed by humans. So, human knowledge is part of Allah's knowledge.

In Quran translation text, vital values of the environment were found. Vital environmental values are vital values that contain knowledge about the environment or ecological or environmental intelligence. Jung stated that human ecological intelligence is an understanding and translation of human relationships with all elements and other living things (Utina, 2012). The understanding and translation begin with knowledge and awareness of what is learned in human relationships with their ecosystems.

The results of the analysis of the vital value of the environment was the life cycle of plants and fruits. Plants grow because of rain and rain water is sent down by Allah. The rain that falls causes the growth of plants. Plants that grow eventually bear fruit, which means they produce fruit. In addition to bearing fruit, plants that grow produce grain that is human food. Pay attention to the following Al-An'am (6:99).

"Dan Dialah yang menurunkan air hujan dari langit, lalu Kami tumbuhkan dengan air itu segala macam tumbuh-tumbuhan maka Kami keluarkan dari tumbuh-tumbuhan itu tanaman yang menghijau. Kami keluarkan dari tanaman yang menghijau itu butir yang banyak; dan dari mayang korma mengurai tangkai-tangkai yang menjulai, dan kebun-kebun anggur, dan (Kami keluarkan pula) zaitun dan delima yang serupa dan yang tidak serupa. Perhatikanlah buahnya di waktu pohonnya berbuah dan (perhatikan pulalah) kematangannya (Al-An'am 6:99).

"And it is He Who sends down rain from the sky, and then We grow with it all kinds of plants, so We bring out green plants from them. We remove from the green plant many grains; and from the palm trees unravel the drooping stalks, and vineyards, and (We also bring out) olives and pomegranates like and dissimilar. Pay attention to its fruit when the tree bears fruit and (pay attention to) its ripeness (Al-An'am 6:99).

In Al-An'am (6:99) it is stated that it is He (Allah) who sends down rain. After sending down rain, Allah makes vegetation grow. From these plants, Allah brings out many grains (grains and fruits). The verse mentions various kinds of fruit: pomegranates, grapes, olives. It is also mentioned in the verse that there is a process of the tree growing, bearing fruit that is not yet ripe, and when the fruit is ripe. The process of all that is not done by humans, but is done by God. In relation to the word rain, this research complements Mauluddin's (2018) study which examines the meaning of the word *hujan* (rain) in the Quran.

The educational value of ecological intelligence talents that can be learned from Al-An'am (6:99) is that there is an interdependence between these elements, except Allah. The elements in question are: God, humans, water, plants, seeds, and fruit. God on which everything depends. Man

depends on God, water depends on God, plants and plants also depend on God. Plants, depending on God, humans, and water. That is, if Allah does not send down water, it means that humans will not live and plants will not be able to grow. Human life and plants/plants depend on water and the existence of water depends on Allah. Plants depend on humans and on God. If there are no seeds planted by humans, no plants will grow, except with the permission of Allah. Humans as creatures created as caliphs on earth have an obligation to protect the natural environment. In this context, humans take care of plants and plants as part of their care and concern for nature and plants. The reward received from caring for and caring for nature and plants, humans get food to meet their needs. Human life also depends on God, nature and plants. The life of plants and the preservation of nature depend on humans and on God. Between nature, plants and humans there is a mutualistic symbiotic relationship. Between the three there is a reciprocal relationship that is mutually beneficial, giving and receiving each other. If the symbiotic relationship between the three is not maintained, harmony in life will not be achieved. If humans do not have concern for nature and plants, they will cause damage. The damage to both resulted in human needs for nature as a place to live, facilities and infrastructure for life are not met. Therefore, to maintain a harmonious relationship between the three elements, humans as caliphs on earth must have concern for nature and plants. The form of care in question is caring for, preserving, and developing it.

As a consequence of their dependence on Allah and as a result of their gratitude, nature, humans, and plants glorify Allah. As stated in "The seven heavens, the earth and all that is in it glorify God (Al-Isra'17:44). The vital value contained in the verse is the knowledge that all God's creatures glorify God by purifying God. This includes humans, plants, nature, and animals. All of Allah's creatures glorify as gratitude to Allah.

The results of the analysis of the vital values and education of environmental intelligence talents are presented in table 3. Pay attention to the table 3 below.

Table 3: Findings of vital values and environmental intelligence talent education

| No. | Quran source | Vital value | Environmental intelligence talent education |
|-----|-------------------|---|---|
| 1. | Al-Baqarah (2:22) | Knowledge that it is God who made the earth a bed and the sky a roof God who sends rain God gives fruit and sustenance to humans | Not only because of human efforts, sustenance exists also because of God's goodness Humans are obliged to manage natural resources and the existence of sustenance from God to meet the needs of all God's creatures |
| 2. | Al-Ma'idah (5:97) | God is All Knowing | Human knowledge is part of Allah's knowledge Human ability to manage natural resources and the environment is part of Allah's knowledge There is no human power without God's intervention |
| 3. | Al-An'am (6:99) | Allah who sends down rain God grows plants Allah brings forth grains (and fruits) All processes from rainwater falling, trees growing, | There are interdependencies among the elements of nature, namely: humans, water, plants, seeds, and fruits Allah is whom everything depends on Humans as creatures were created as caliphs on earth and have an obligation to protect the natural environment |

| | | |
|----|--|--|
| | fruiting and ripening are carried out by Allah | Between nature, plants, and humans, there is a mutual symbiotic relationship. Humans must have concern for nature and plants by caring for, preserving, and developing them |
| 4. | Al-Isra'(17: 44) Nature, humans and plants glorify Allah | Humans as part of Allah's creatures should glorify Allah That the kingdom of God is perfect, far from all flaws and that there is no partner for Him The human obligation is to be grateful for, maintain, and manage the perfection of God's work and His creation. |

The findings of material and vital values are basically the foundation of faith. This foundation of faith is the basis for the development of social intelligence [38]. Faith-based intelligence can shape Islamic personality in the form of good behavior as exemplified by the Prophet Muhammad.

This research examines social values, especially material values and vital values. So, this research is different from the research of Markhamah and Sabardila [2], [3], and also different from the research of Markhamah, et al., [4], [5], [6], [7] which examines the translation of the Quran with linguistic theory.

In relation to the study of environmental intelligence, the results of this study complement the ecological studies in the Quran including about natural intelligence [17]; [18] ecological education in an Islamic perspective [19] and the Quranic insight on nature conservation [20], [21], and [22]. This study focused on the translation of the Quran which uses the word *langit* (sky, heaven). In relation to environmental ethics, Al-An'am (6:99) is related to the hadith as quoted [38]. The relevant hadith snippet, "Verily God is good, He loves good; God is clean, He loves cleanliness; God is glorious, He loves glory; God is generous, He loves generosity. Then clean up - I..." (HR. Muslim 2536, Ibn Mjajah 2237, Ahmad ibn Hanbal 16689, al-Darimi 2437).

In perspective of non-linguistic research, this research complements the diversity of studies on the Quran and or its translation that have been carried out by Markhamah, et al. [8] [9] on the character of the Prophet and by Aziz [10] and Maslamah [11] on gender.

The following concludes the results of the analysis of material values in the Quran translation text containing the word *langit* (sky, heaven). The material values found were: (1) invitation material value and (2) prohibition material value. The material values of invitation included invitation to: (a) act to protect oneself when there is danger, (2) ask God for forgiveness, (3) be pious, (4) pray, (5) worship God, (6) have faith, (7) surrender to God. The material values of invitation to educate social intelligence talents included: (1) do something to prevent harm, (2) in regards of mistakes, ask God for forgiveness and apologize to fellow human beings, and (3) help and pray for others.

The material values of prohibition included the prohibitions of: (1) being stingy people, (2) wanting to see God with the naked eye, (3) going beyond the limits of religion, (4) saying that God is more than one, (5) being ignorant, (6) replacing (the word) Allah with another word, and (7) stating that Allah has children. The material value of prohibition that can educate the talents of social intelligence included: (1) being a generous human being, (2) not equating the essence of God with everything in the world, (3) behaving naturally, not being extreme, (4) not arbitrarily stating the nature and things about God that are not true, and (5) seeking and studying knowledge, especially religious knowledge as a provision for social life.

The vital values found in this study were: (1) God who made the earth as a bed and the sky as a roof, sends down rain, gives fruit and sustenance to humans, (2) all processes from rain water descent, trees grow, bear fruit, until the fruit ripens. done by Allah, (3) Allah is All-Knowing. These vital values educate the talents of environmental intelligence: (1) sustenance is not solely due to human efforts, but also because of God's goodness, (2) humans are obliged to manage the source and existence of sustenance from God to meet the needs of all God's creatures, (3) human abilities in managing natural resources and the environment is part of the knowledge of Allah as the All-knowing, (4) there is interdependence among the elements: humans, water, plants, seeds, and fruit, and (5) there is a mutualistic symbiotic relationship between nature, plants and humans.

AUTHORS' CONTRIBUTIONS

The first author designed the study, carried out data collection, data analysis, and wrote the publication article. Other authors, lecturers contributed to data collection, data analysis, and review and provide input on article writing. Students contributed to data collection and assisting with data analysis.

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Cohesion in Lyrics of Songs with Covid-19 Prevention Theme as Public Education

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ABSTRACT

The purpose of this research is to analyze cohesion markers contained in the song lyrics with theme of Covid-19 prevention. The type of research is descriptive qualitative. The data in this study are in the form of words, phrases, clauses, sentences and stanzas contained in the songs. Data were analyzed descriptively for both lexical and grammatical cohesion. The data sources include the lyrics of the song *Di Rumah Saja* by Sam Bimbo, *Virus Corona* by Rhoma Irama, *Bangkit* by Wan Rahil Apriliady, *Cahaya dalam Kegelapan* by Susilo Bambang Yudhoyono. The results showed that the most common cohesion marker found was lexical cohesion in the form of collocation. This indicates that there is an emphasis on the same meaning in every song lyric. The similarity of meaning is assembled and poured in every line and stanza which is full of meaningful messages for the community, so that the songs function as a medium for conveying messages to the community. The lyrics of the song provide educational value about: (1) appeal to people not to leave their homes so that the virus does not spread further, (2) humans asking God for protection to avoid covid-19, (3) invitation to rise up to fight covid-19, (4) when trials come, humans must be optimistic, pray to God, and share.

Keywords: song lyric, cohesion, covid-19

INTRODUCTION

Since mid-2019, the world has been shocked by the outbreak of a new pneumonia called the corona virus disease 2019 or covid-19. The outbreak caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) first appeared in Wuhan City, Huberi Province, China [1]. The spread of the virus was only confirmed in Indonesia in early March 2020. This epidemic has made the order of life in various countries into chaos, including Indonesia.

The increasing number of positive cases of COVID-19 in Indonesia made famous musicians such as Sam Bimbo, Rhoma Irama, and a number of musicians work together to create songs. Not only musicians, the former President of the Republic of Indonesia, Susilo Bambang Yudhoyono, to a student from Bengkilas Regency named Wan Rahil Apriliady also created songs for the community during this pandemic. This is done in the context of educating the public about Covid-19 prevention in a light way through entertainment.

Song is a discourse that is expressed in the form of sound and music. In it there are lines of lyrics that contain messages or expressions of the author's heart. The message contained in the song is usually an invitation, provocation, also teaches something to the listener [2]. A good song contains lingual units that are easy for listeners to understand and interpret. By understanding and interpreting a discourse as a whole, listeners can conclude as well as take the message contained in it.

The integrity of a discourse can be seen from the unity of form or cohesion. If a listener in an oral discourse or a reader in a written discourse wants to know the cohesiveness of a discourse, it can be seen from the cohesion markers in it. Cohesion is the relationship between parts in the text that are bound by language elements so that the discourse feels cohesive [3]. Between one sentence and another there is a relationship that creates a network, and this network is formed from a cohesive relationship [4]. There are two markers of cohesion, namely (1) grammatical cohesion and (2) lexical cohesion [5].

There have been many studies related to cohesion in a discourse. The research conducted by Herianah found grammatical cohesion markers namely references, substitutions, ellipsis and

conjunctions as well as lexical cohesion markers namely repetition, synonyms, antonyms, collocations, hyponyms and equivalences in a poem [6]. Nursyamsi's research results showed that songwriters utilize various grammatical and lexical aspects. The grammatical aspects used are references which consist of personal references, demonstrative references, and comparative references, omissions, and concatenation; while the lexical aspects used are repetition, synonymy, collocation, antonymy, and hyponymy [7]. Alimin found grammatical markers in the form of reference, inspiration, elimination, and stringing, as well as lexical markers in the form of repetition, synonymy, antonym, and collocation [8]. Septianingrum and Sabardila found lexical and grammatical cohesion markers in the "Selebritas" rubric discourse and can be used as teaching materials to compose narrative texts. [9].

The purpose of this study is to identify cohesion markers, both lexical and grammatical cohesion contained in song lyrics with the theme of preventing Covid-19 and their educational value. During the Covid-19 pandemic, a work in the form of a song is very effectively used as a medium to convey public health education messages, with a light tone.

LITERATURE REVIEW

Song lyrics or a poem can be interpreted as a written form of art similar to poetry [10]. The language of the song lyrics is a language that is condensed, shortened, and rhythmic with a coherent sound and the choice of figurative and imaginative words. [11]. The lyrics of the song contain the meaning or message conveyed either explicitly or implicitly by the songwriter as an expression of the heart to the listener. This is because the song is seen as a medium for expressing art, creativity and expression [12]. As a form of self-expression, sound and music can also be said as discourse [13]. It can be concluded that discourse is basically a form of communication, both oral and written.

Cohesion is a syntactic organization whose sentences are arranged coherently to produce discourse both from a grammatical and lexical point of view [14]. Grammatical cohesion markers are cohesion markers that involve the use of elements of language rules [15]. Grammatical cohesion markers consist of references, substitutions, ellipsis and conjunctions. Lexical cohesion or lexical fusion is a lexical relationship between parts of discourse to get a cohesive structural harmony [16]. Lexical cohesion markers consist of repetition, synonym, antonym, hyponym, collocation and equivalence.

Grammatical cohesion is a combination of forms between sentences related to the external structure or grammatical structure.

The first marker of grammatical cohesion is a reference which is a certain lingual unit which refers to another lingal unit that precedes or follows [17], or reference exophores and endophores. References are divided into persona references consisting of person 1, person 2, person 3, both singular and plural, and demonstrative references [18]. Demonstrative references are divided into time or temporal and place or locational demonstrative pronouns, comparative references or comparisons that compare two or more things that have the same attitude, nature, character and so on.

Substitution grammatical cohesion markers are the substitution of certain lingual units with other linguistic units to obtain differentiators in a discourse [19].

An ellipsis grammatical cohesion marker is the omission of some sentence elements. Ellipsis is almost the same as substitution, the difference is that ellipsis is a substitution with something empty [20]. The shape or element that is omitted can actually be estimated based on the context of the language or outside the language.

Conjunction grammatical cohesion markers are words that are used to connect phrases, clauses, sentences in larger units [21]. In addition, conjunctions can also be used to connect paragraphs.

To form a cohesive discourse, lexical cohesion has a role in supporting the formation of cohesive discourse [22]. There are several meanings in lexical cohesion, including lexical cohesion markers which consist of a cohesive form that matches the word, namely reiteration and collocation. [23].

In addition, lexical cohesion can also be in the form of repetition, synonyms, collocations, and equivalences. [24].

Reiteration lexical cohesion markers are divided into: (1) repetition in the form of repetition of sound units. (2) Synonyms are linguistic units that have more or less the same meaning as the meaning of other expressions. (3) Hyponyms are words or phrases whose meaning is included in the meaning of other words or phrases. (4) A metonym is part of the repetition of a certain person, thing, or name that is considered popular. (5) Antonyms are propositions or opposites.

In addition, there is also lexical cohesion in the form of collocation which means the same meaning in the same sentence or paragraph.

RESEARCH METHOD

The type of this research is descriptive qualitative. The data in this study are in the form of words, phrases, clauses, sentences and stanzas contained in song lyrics related to Covid-19 prevention. The data source used is the lyrics of the song *Di Rumah Saja* by Sam Bimbo, *Virus Corona* by Roma Irama, *Bangkit* by Wan Rahil Apriliady, *Cahaya dalam Kegelapan* by Susilo Bambang Yudhoyono

Data collection in this study utilized the method of documentation and observation. The observation method was by paying attention to the use of language both spoken and written [25]. The observation method was followed by the note-taking technique as an advanced technique. The document in this research were Covid-19 prevention songs on YouTube and websites. The listening method in this study was carried out by the researcher observing, both reading the lyrics of the song and listening to the song in its entirety. Next, the researcher made orthographic transcriptions for all song lyrics, then followed up by recording the data included in the cohesion markers.

Analysis of the data used the constituent analysis method with various techniques (deletion, substitution, permutation, combination, repetition, expansion, and paraphrasing) as well as the referential identity method to identify cohesion markers in the song lyrics under study. For data validation, researchers used data source triangulation and theory triangulation.

RESULTS OF RESEARCH

Markers of Grammatical and Lexical Cohesion in Song Lyrics *Di Rumah Saja (Just Stay at Home)* by Sam Bimbo

The grammatical and lexical cohesion markers in the lyrics of this song are described in table 1.

Table 1. Song Lyric of *Di Rumah Saja* by Sam Bimbo

| |
|--|
| Di Rumah Saja Sam Bimbo |
| Di rumah saja, ¹ buka puasa (1) |
| Di rumah saja, kita tarawih (2) |
| Di rumah saja, ² rutin tadarus (3) |
| Di rumah saja, ibadah kita (4) |
| Musibah ³ datang, bawa bencana ³ (5) |
| Umat manusia, berwajah duka (6) |
| Berbaik sangka, sholat, berdoa (7) |
| Semoga Allah mengabulkannya ⁴ (8) |

Bersihkan hati (9)
Bersihkan diri (10)
Ikhlas dan sabar (11)
Mau lebaran (12)
Janganlah mudik (13)
Jangan mudik dulu (14)
⁵Buka puasa, di rumah saja (15)
Kita tarawih, di rumah saja (16)
⁶Rutin tadarus, di rumah saja (17)
Ibadah kita, di rumah saja (18)
⁷Buka puasa, di rumah saja (19)
Kita tarawih, di rumah saja (20)
⁸Rutin tadarus, di rumah saja (21)
Ibadah kita, di rumah saja (22)

The first song entitled *Di Rumah Saja* by Sam Bimbo is a cohesive discourse. This is because there are elements that build cohesiveness in the song. The grammatical cohesion markers found were 6 ellipsis, 1 reference, 3 repetitions, 1 synonym, 3 hyponyms, 4 collocations.

There are ellipsis or omissions found in lines 1, 3, 15, 17, 19, and 21. In these lines there is an ellipsis in the form of an omission of the word *kita* (us) which is the subject (S). When assembled into a complete sentence it becomes:

Di rumah saja, (kita) buka puasa)
Di rumah saja, (kita) rutin tadarus
(Kita) buka puasa, di rumah saja
(Kita) rutin tadarus, di rumah saja

The references found are demonstrative references that explain the context. On the 8th line there is the word *mengabulkannya* (grant) it which is a reference used to show that in the current situation humans, religious people should try and pray in the face of the covid-19 outbreak.

The existence of repetition of words that occur in almost every stanza emphasizes that at this time we are encouraged to stay at home. This is also in line with the song title given. The synonyms in line 5 describe the epidemic that occurred which was written with the words calamity (*musibah*) and disaster (*bencana*). The hypernym in the lyric experience is worship (*ibadah*) followed by the speech word. The collocations found are dominated by the worship domain in almost every stanza. This is because the spread of covid-19 in Indonesia occurred in early March, a few months later entering the month of Ramadan, so the song were adapted to the conditions and circumstances experienced at that time, namely Muslims carrying out a series of worship in the month of Ramadan in the midst of a pandemic of covid-19.

The educational value in the song is to appeal to people not to leave their homes so that the virus does not spread further. If people do not leave their homes, the potential for the spread of the virus is reduced because one of the media for the spread of the virus is the interaction between humans. This educational value can be read in the title of the song.

Markers of Grammatical and Lexical Cohesion in the Lyrics of *Virus Corona* by Rhoma Irama

The results of the analysis of Grammatical and Lexical Cohesion markers in the *Virus Corona* Song Lyrics by Rhoma Irama can be seen in table 2.

Table 2: Song Lyric of Virus Corona by Rhoma Irama

| |
|--|
| <p>Virus Corona Rhoma Irama</p> <p>Kengerian yang mencekam¹, melanda segenap ala (1) Kala makhluk itu datang menyerang¹ dan² mematikan¹ (2) Dia tak terlihat mata, tak bisa diraba (3) Namun³ sangat mengerikan¹, seluruh manusia (4) Hampir di segenap negeri, mereka menutup diri⁴ (5) Isolasi⁴, bersembunyi⁴, ketakutan tak terperi (6) Hanyalah padaMu⁵, Tuhan⁵, kami mohon perlindungan (7) Dari ancaman bahaya virus yang makin mewabah (8) Berilah inayah untuk menghentikan (9) Mata dunia terbuka, betapa lemah manusia (10) Walaupun sudah digdaya, ternyata rapuh adanya (11) Hanyalah dengan mikroba bernama Corona (12) Sungguh telah menghancurkan sendi kehidupan (13) Ikhtiar dan⁶ juga doa mari kita upayakan (14) Agar dunia terbebas darinya⁷, virus Corona⁷ (15)</p> |
|--|

This second song was a cohesive discourse because there are elements that build cohesiveness in it. The cohesion markers found are 2 references, 1 synonym, 3 conjunctions, and 4 collocations. The references found are cataphoric references whose references are after the text. The first reference to data 5 in the 7th row shows God (*Tuhan*) as supreme (*maha*) over all things. The second reference in the 15th line of 7 data points to covid-19. The synonyms found in the lyrics of the song are mentions for the equivalent of closing oneself (*menutup diri*), namely isolation (*isolasi*), and hiding (*bersembunyi*). The conjunctions used are coordinating conjunctions in data 2 and 6. In addition, there are also contradictory conjunctions in data 3 which are written with the word but. The collocation in this song is different from the previous song. The collocation contained seems to also describe the nature of Covid-19 as mentioned in data 1.

The educational value of the song includes: (1) the existence of the covid-19 virus creates a tense and terrible atmosphere, (2) all humans cover themselves and hide, (3) humans ask God for protection to avoid the attack of covid-19, (4) humans ask God to stop the covid-19 outbreak.

Markers of Grammatical and Lexical Cohesion in the Lyrics of *Bangkit* by Wan Rahio Apriliady

The results of the analysis of Grammatical and Lexical Cohesion markers in the song *Bangkit* (Rise) by Wan Rahio Apriliady is described in table 3.

Table 3. Song Lyric of Bangkit by Wan Rahil Apriliandy

| |
|--|
| <p>Bangkit Wan Rahil Apriliady</p> <p>Jangan cemas jangan panik¹(1) Apa lagi sampai frustrasi¹(2) Ayo lawan pandemi ini²(3) Covid-19² kita kan perangi (4)</p> |
|--|

Tak sama sekali sulit (5)
Apalagi keluar banyak duit (6)
Situasi seperti ini²(7)
Kalau bukan kita yang bangkit (8)
Lalu³ siapa lagi?(9)
Ayo budayakan hidup bersih (10)
Lindungi orang lain dan⁴ dirimu sendiri (11)
Anjuran pemerintah harus dipatuhi (12)
Ikuti saja langkah langkah ini⁵(13)
Cuci tangan⁶ setelah memegang sesuatu (14)
Gunakan masker⁶ jika keluar dari rumahmu (15)
Jangan kemana mana dirumah aja⁶ dulu (16)
Jika ada keramaian hindari⁶ saja dulu (17)
Rajin olahraga⁶ dan istirahat yang cukup(18)
Selalu jaga kekebalan imun⁶ tubuh (19)
Dan lingkungan yang bersih(20)
Itu sudah tentu(21)

The third song above is a cohesive discourse. There are elements that build cohesiveness in the song. The cohesion markers found were 3 references, 2 conjunctions, and 2 collocations. The reference found is a demonstrative reference which shows the context in data 2. The context described by the referent is covid-19. The references contained in data 5 show references related to how to prevent the transmission of covid-19. The conjunctions found in the song are coordinating conjunctions. The collocations found are the words panic (*panik*) and frustration (*frustasi*). This indeed illustrates the psychological condition of the community in dealing with the increasingly endemic Covid-19.

The educational value of the song is an invitation to comply with government recommendations, namely maintaining cleanliness and complying with health protocols. The next invitation is to rise up to fight Covid-19.

Markers of Grammatical and Lexical Cohesion in the Lyrics of *Cahaya dalam Kegelapan* (Light in Darkness) by Susilo Bambang Yudhoyono

Table 4 is a description of Grammatical and Lexical Cohesion Markers in the Lyrics of the Song by Susilo Bambang Yudhoyono

Table 4. Song Lyric of *Cahaya Dalam Kegelapan* by Susilo Bambang Yudhoyono

Cahaya dalam Kegelapan
Susilo Bambang Yudhoyono

Jika bumi ini terasa gelap¹ (1)
Menabur takut¹ di mana mana (2)
Hati gamang¹ lanjutkan hidup (3)
Masihkah kulihat cahaya (4)

Badai Corona datang menerjang² (5)
Menembus² dunia tak terbatas (6)
Tangis pecah di malam hari (7)
Menunggu datangnya harapan (8)

Cahaya ada dalam hati kita (9)
Dalam jiwa-jiwa penuh kasih (10)
Harapan ada dalam hidup kita (11)
Untuk yang mau berbagi (12)

Mendung hitam³ itu akan pergi (13)
Bersinar indah mentari pagi⁴ (14)
Tuhan tersenyum taburkan berkah (15)
Bagi yang tak pernah menyerah (16)

Cahaya dalam gelap (17)
Harapan ada (18)
Jiwaku⁵ penuh kasih (19)

Mendung hitam itu akan pergi (20)
Bersinar indah mentari pagi (21)
Tuhan tersenyum taburkan berkah (22)
Bagi yang tak pernah menyerah (23)

Cahaya ada dalam hati kita (24)
Dalam jiwa-jiwa penuh kasih (25)
Harapan ada dalam hidup kita (26)
Untuk yang mau berbagi (27)

Cahaya ada dalam hati kita (28)
Dalam jiwa-jiwa penuh kasih (29)
Harapan ada dalam hidup kita (30)
Untuk yang mau berbagi⁶ (31)
Untuk yang mau berbagi⁶

This song is a cohesive discourse. There are elements that build cohesiveness in the song. The cohesion markers found were 1 reference, 1 repetition, 1 antonym, 1 collocation. The reference contained in this song is the reference to the first personal pronoun, which is shown in data 5. My soul (*jiwaku*) refers to the writer, Susilo Bambang Yudhoyono, who also felt the impact of Covid-19. The repetition that appears in data 6 shows that there is an emphasis that in the current situation, in an era that is completely limited, people experience changes in their lifestyle. At the end of the song, it is emphasized for those who want to share (*mau berbagi*) twice, namely in the fourth and fifth lines. Synonyms are shown in the 2nd data that are hit (*menerjang*) and penetrate (*menembus*). Antonyms are in the 3rd and 4th data, *mendung hitam³ itu akan pergi*, *bersinar indah mentari pagi⁴* (the dark cloud will leave, morning sun shine beautifully).

The antonyms contained in the song describe the writer's hope for the community in dealing with Covid-19.

The educational values that can be learned from the 4th song are: (1) light is in our own hearts, (2) people need to believe that trials will disappear and will be replaced with hope, (3) people must be willing to share, (4) God will give blessings to his people who do not give up. In general, the educational value of the lyrics of this song is that when trials come, humans must be optimistic that the trials will disappear when humans try and are willing to share.

Based on the results of the analysis of the 4 song lyrics, it can be seen that the grammatical and lexical cohesion markers are as shown in table 5.

Table 5. Grammatical and Lexical Cohesion Marker Data

| Marker | Data Number |
|----------------------|--------------|
| Grammatical Cohesion | Reference |
| | 7 |
| | Substitution |
| | 0 |
| Lexical Cohesion | Ellipsis |
| | 6 |
| | Conjunction |
| | 5 |
| | Repetition |
| | 4 |
| | Synonym |
| | 3 |
| Lexical Cohesion | Antonym |
| | 1 |
| | Hyponim |
| | 3 |
| Lexical Cohesion | Collocation |
| | 11 |

The most common marker of cohesion is collocation. This indicates that there was an emphasis on the same meaning in each song lyric. The similarity of meaning was assembled and poured in every line and stanza which were full of meaningful messages for the community.

AUTHOR CONTRIBUTION

In this study, Yenny Puspitawati was tasked with finding data, analyzing data, and compiling manuscripts. Markhamah, in charge of drafting the manuscript, deepening the theory and reviewing the manuscript. Likewise, Atiqa Sabarlia is in charge of reviewing the manuscript.

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