the 2nd **ICONESTH** 2024

UNIVERSITAS BINA BANGSA GETSEMPENA UBBG

Kampus Merdeka INDONESIA JAYA

THE 2nd INTERNATIONAL CONFERENCE ON EDUCATIONS, SCIENCE, TECHNOLOGY AND HEALTH

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BEYOND BOUNDARIES: INTERDISCIPLINARY APPROACHES TO GLOBAL CHALLENGE

DECEMBER 10-12th 2024
08.00 am - 05.00 pm
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Keynote Speaker

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Venue

Plenary Hall
Universitas Bina Bangsa Getsempena
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1st December 2024 Abstract Submission Deadline

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THE PREGNANT MOTHERS' INTEREST TO CONDUCT HIV TESTING IN SUPPORTING THE PREVENTION OF MOTHER-TO-CHILD HIV TRANSMISSION

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ABSTRACT

Human Imunnodefiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) is a disease that continue to grow and become a global health problem which occurs in both modern and developing countries. HIV transmission can occur through needles and blood transfusions. However, it can occur from HIV-positive mother to their unborn baby. One of the ways which can be conducted by pregnant mother is conducting HIV test during pregnancy. However, there is still a lack of interest in pregnant mothers therefore many mothers do not conduct HIV tests. Whereas the mothers' interest is highly important to enhance the pregnant mothers' participation to conduct HIV test. The objective of this research was to investigate the pregnant mothers' interest in supporting the prevention of mother-to-child transmission at Godean I Health Center, Sleman Yogyakarta. The method of the research was qualitative with phenomenological approach. The informants of this research were taken by using purposive sampling technique, there were 11 informants consisting of 4 pregnant mothers who had conducted HIV test and 6 pregnant mothers who had not conducted HIV test. The result was obtained 4 themes, namely Attitude towered, Subjective norm, Perceived Behavior Control, and the mothers' interest HIV test. The conclusion is that there are still many mothers who have negative opinions related to HIV testing during pregnancy, and public perception that still considers the taboo regarding HIV testing. The informant conveyed that the support in conducting HIV test came from internal and external factors. The obstacles faced by pregnant mothers in conducting HIV tests are caused by internal and external factors. While for the interest, the majority of pregnant mothers are not interested in taking an.
Keywords: Pregnant Mothers' Interst. HIV Test, PMTCT

INTRODUCTION

Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) are a disease that continues to grow, and become a global health problem that occurs in both developed and developing countries (Adhiputra, 2018). HIV transmission occurs through sexual intercourse, use of needles, blood transfusions, and transmission that occurs from pregnant women who are HIV positive to their unborn babies (Omonaiye *et al.*, 2018).

Pregnant women are a group that is very susceptible to disease. Pregnant women who are HIV positive will threaten the safety of the mother and the unborn baby. Babies who are conceived will not only be infected with HIV but are also at risk of death (Hung *et al.*, 2020). Lack of interest in pregnant women to take HIV tests is still a problem faced today. A mother's interest is very important in increasing maternal participation in HIV testing, because if the mother does not do an HIV test, the mother's HIV status is unknown, and the mother does not receive antiretroviral (ARV) therapy, which is a drug that must be taken by HIV-positive mothers during pregnancy. This will increase the risk of mother-to-child transmission of HIV (Wardhani *et al.*, 2019).

The provision of ARV to pregnant women who are confirmed to be HIV positive is part of the Prevention of Mother-to-Child Transmission (PMTCT) program (Widayanti, 2020). The PMTCT program has existed since 2005 and has been implemented by several regions in Indonesia. The target of the PMTCT program is that 100% of pregnant women who undergo a pregnancy check-up can receive information related to Safe Motherhood, safe sex practices, prevention and treatment of Sexually Transmitted Infections (STIs), HIV testing and treatment during pregnancy, as well as post-test counseling and follow-up services (Ulfah *et al.*, 2020).

Based on data obtained from the United Nations Program on HIV and AIDS (UNAIDS) and the World Health Organization (WHO) in 2018, the number of people living with HIV in the world is 36.9 million. The number of HIV-positive women increased by 50%, this was due to the large number of men who had unsafe sex. In South and Southeast Asia, there are 4 million women with HIV and AIDS during pregnancy but who screen for HIV only 7% of 359/100,000 pregnancies, this figure is still far from the target that has been set (Ayu & Ulung, 2023).

HIV cases in pregnant women in 2017 have been reported in 407 districts/cities. Based on data from the Ministry of Health of the Republic of Indonesia in 2020, out of 2,404 pregnant women, only 2,398 people were tested for HIV. The highest HIV cases in pregnant women were in West Papua with a percentage of 2.56%, and Yogyakarta was in the 24th place with the highest number of HIV in pregnant women after North Kalimantan (Kemenkes RI, 2021).

Data from the Yogyakarta Special Region (DIY) Health Service in 2020 regarding HIV. Cumulative HIV cases until 2019 were 1,335 cases. The highest HIV cases were found in the productive age group, namely 20-29 years and 30-39 years. Based on data in 2021, a total of 64 pregnant women with HIV were positive. Sleman occupies the third position with the highest HIV cases in pregnant women after Bantul and Gunung Kidul. In 2020, only 2 cases of pregnant women who were HIV positive in Sleman, then there was an increase in 2021 to 11 people (Heath *et al.*, 2021).

Data from the Sleman Health Service in 2021, the number of pregnant women is 10,099 people. While 9,990 people did the HIV test and 11 were HIV positive. From the data above, there are still pregnant women who do not test for HIV. from 25 health centers in the Sleman district, the health center Godean I is the health center with the most cases of pregnant women who were confirmed to be HIV positive in 2019, namely 36 people (Dinkes Sleman, 2020).

Based on the description above, the researcher is interested in conducting research related to "The Pregnant Mothers' Interest To Conduct Hiv Testing In Supporting The Prevention Of Mother-To-Child Hiv Transmission"

METHODS

This research is qualitative research with a phenomenological approach. The participants in this study were pregnant women who took an HIV test and pregnant women who did not do an HIV test at the Public Health Center Godean I. Participants were determined using a purposive sampling technique. This study uses primary data sources. The research data was obtained by interviewing 11 informants, in a face-to-face interview with an interview time per informant of ± 15-25 minutes. The interview process was carried out using an interview guide that had previously been tested (pilot interview) on informants who had the same characteristics as the informants used. The research was conducted after

obtaining approval from the ethics committee of Aisyiyah University Yogyakarta and obtaining permission from the Sleman Health Office and Godean I Health Center which will be used as research sites. Previously, the informant was also given an explanation related to the research to be carried out, after the informant agreed and signed the informed consent, the researcher made a time contract with the informant and asked the informant whether the interview was conducted online or offline. The research was conducted at the Public Health Center Godea I, Sleman Yogyakarta, which was conducted for two weeks. The data obtained in this study were analyzed manually and guided by the theory of Michael & Huberman in 2010 which consisted of data analysis, data reduction, data presentation, conclusion drawing, and verification.

RESULTS AND DISCUSSION

Result of the research

From the results of the research that has been done, four themes have been obtained. The first theme is *Attitude towarde* with a sub-theme of views related to HIV testing. The second theme is Subjective norm with sub-themes of public perception regarding HIV testing, and support for conducting HIV tests. The third theme is Perceived Behavior Control with a sub-theme of obstacles in carrying out an HIV test. The fourth theme is the mother's interest in HIV testing. The themes and sub-themes in this study are described in chart 1 as follows:
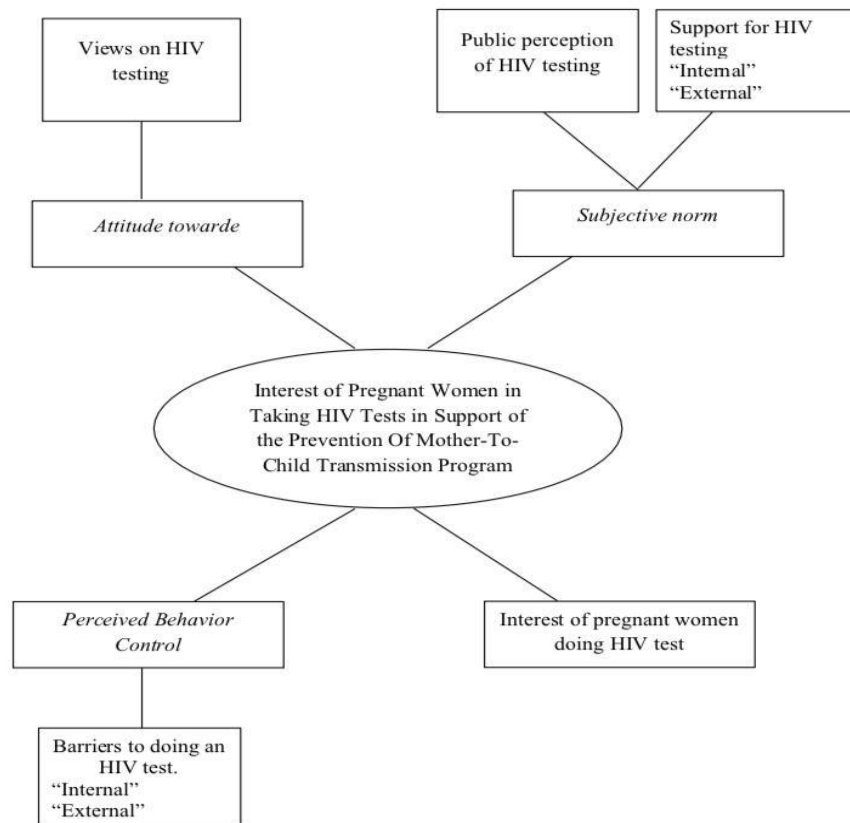
Discussion

Based on the results of research that has been carried out regarding "The Pregnant Mothers' Interest To Conduct Hiv Testing In Supporting The Prevention Of Mother-To-Child Hiv Transmission"and obtained 4 research theme. The first theme is Attitude towarde (attitude towards behavior). Attitude is a tendency to respond to things that are liked by someone (Ajzen, 2012). Attitude towards a behavior is the first variable that affects a person's intention to behave. When individuals think positively of action, they will have the will to do that action[12]. Attitude towarde is a belief in positive feelings or negative feelings to display a certain behavior. A person will perform a certain behavior if they evaluate it positively (Ajzen, 2012)

From the results of the study, it was found that pregnant women had positive and negative attitudes towards HIV testing. Mothers who have a positive attitude will be interested in taking an HIV test and vice versa, mothers who have a negative attitude will definitely not intend to do an HIV test. This is in accordance with research conducted by[11], results of this study saying that a person will have an intention if that person has a positive view of what will be done. When someone knows about the things they are doing, the benefits, and the impact that will be obtained positively, they will do it[11]. When someone has a positive attitude and knows the effects, and the perceived impact, then they will be easy to accept and intend to do something (Hutagaol, 2022).

A subjective norm theme is an individual's belief that is obtained from the views of others on the object of attitude related to the individual[11]. Subjective norms originate from the influence of other people who are considered important. People who are in an environment that gives positive encouragement to individuals to do something, then the individual will have the intention to do that. Conversely, if the individual lives or is in an environment that does not agree with the recommended positive behavior, the intention to do something will also not exist (Famil, 2021).

The results of the research on Subjective norm reveal the community's views regarding HIV testing and support for carrying out HIV tests both internally and externally. People's views that are still considered taboo regarding HIV testing have resulted in them not taking an HIV test. There are still many people who do not do an HIV test because they feel ashamed of the negative stigma they get from both the community and their partners so that which causes mothers to be reluctant to take an HIV test. The fear of being ostracized, experiencing physical and verbal violence, gossip, and even being divorced by her husband makes the community, especially pregnant women, reluctant to take an HIV test (Syagran & Setianto, 2021).

From the results of research on support for HIV testing, it is said that the support that pregnant women get to do an HIV test comes from internal and external factors. Support for pregnant women comes from husbands, family, and friends. Research conducted by[16] states that the husband's support and participation in carrying out HIV tests on pregnant women has a positive impact on the intentions of pregnant women to be able to do an HIV test. A husband's support is very important for mothers and helps mothers in making decisions to do or not to do an HIV test (Dewi *et al.*, 2021). A husband's support is very important for pregnant

women. Pregnant women need support from their partners to be able to do something positive, for example an HIV test[17].

The theme of Perceived Behavior Control or behavioral control is an individual's perception of how easy or difficult it is to carry out a behavior. 11. The results of research on Perceived Behavior Control, reveal that there are obstacles for pregnant women to do an HIV test. These obstacles come from internal and external factors. The lack of willingness of pregnant women to take an HIV test causes the mother not to take an HIV test, this is in accordance with research which says that if pregnant women have knowledge about HIV testing but do not have the will or belief in HIV testing then they will not take an HIV test (Simangunsong *et al.*, 2020). The higher the willingness or preparedness of a person to do something, the greater the desire to do it and vice versa (Sekar *et al.*, 2021).

External factors that cause pregnant women not to do HIV tests are due to the lack of education they receive from health workers, especially regarding HIV testing, which causes knowledge that is still lacking. The lack of knowledge is caused by the lack of education they receive regarding the need to take an HIV test during pregnancy. The lack of knowledge and education obtained by mothers regarding the necessity of taking an HIV test causes mothers not to take an HIV test (Irmayati *et al.*, 2019) This is due to the better knowledge of mothers and the more frequent education they receive regarding HIV testing, the more likely mothers are to be able to do an HIV test (Putri *et al.*, 2021).

The theme of pregnant mothers' interest conduct HIV test or intention is defined become individual subjective probability dimension related to self and behavior[11]. The interest or desire of pregnant mothers to conduct or not to conduct HIV test will be different from one to another. The result showed that many mothers who do not interest conduct HIV test. There is no mothers' interest is due to support from the partner, good knowledge, and positive perception of what will be conducted so someone will have the intention to do something later (Agnes *et al.*, 2020). Positive perception, knowledge, support for HIV test have also relationship with the mothers' desire to do HIV test. That is conveyed those positive perceptions, knowledge, support will affect the mothers' desire to do PMCT, namely the higher HIV test. On the other hand negative perceptions that is lack of knowledge and family support also affect the mothers' desire to conduct HIV (Agnes *et al.*, 2020).

The limitations of this study are that the data collection in this study is only seen from the point of view of pregnant women who have had an HIV test and pregnant women who have not done an HIV test, so it is less varied than if there is also data from the point of view of health workers and husbands, or family related to the interest of pregnant women in carrying out HIV tests. The novelty of this study with previous research is that this study focuses on finding out the interest of pregnant women to do a qualitative HIV test and using participants from two different poles so that the data obtained is more in-depth and informative from two different perspectives. Research on interest in this study uses the theory of Fishbein and Ajzen, 2010 where the interest can be seen in terms of attitude toward behavior, subjective norms, and perceived behavior control which are expected to provide more complete information. The hope for further research is to expand the study not only to see the interests from the mother's perspective but also from the perspective of health workers and people in their environment such as husbands, parents, and others so that they can find different findings from this research.

CONCLUSION

From the research that has been done, there are 4 themes. Theme 1 Attitude towarde with sub-theme views of pregnant women related to HIV testing, there are positive and negative views. Then for the second theme Subjective norm there are 2 sub themes, namely public perception regarding HIV testing, and support in carrying out HIV tests. From the collected data, many informants said that the community still considered it taboo related to HIV testing. Meanwhile, for support for conducting an HIV test, the informant said that support came from her husband, family, and friends. For theme 3 Control beliefs with 1 sub-theme of obstacles in doing HIV tests, it is said that the obstacles to doing HIV tests come from internal and external factors. Internal factors consist of willingness and knowledge, while external factors are caused by the lack of education provided by the midwife and the absence of the husband's support. Theme 4 regarding the interest of pregnant women in taking HIV tests, it can be concluded that the interest of pregnant women to take HIV tests is still lacking, there are still many pregnant women who are reluctant to take HIV tests.

It is hoped that this research can increase the interest of mothers to do HIV tests so that they can reduce the mortality and morbidity rates

for mothers and babies caused by HIV. And for the health office and public health center, it is hoped that the research can be used as an evaluation material to make or enforce policies optimally, and for the public health center it can also improve services, especially regarding the provision of counseling related to HIV and the necessity to do HIV tests for pregnant women. Future researchers are expected to further expand the study not only to see the interests of mothers but also from the perspective of health workers and people in their environment such as husbands, parents, and others so that they can find different findings from this study.

ACKNOWLEDGEMENT

REFERENCES

Adhiputra, A., Hiv/Aids Model Layanan Profesional Konseling Berbasis Front-End Analysis: PSIKOSAIN; 2018.

Agnes, Y.L., Haryuni, S. & Rahayu, K.I.N., Women's Intention to Undertake an Hiv Test: A Concept Analysis, *Journal for Quality in Public Health*, 2020;4(1):165-168.

Ajzen, I., Martin Fishbein's Legacy: The Reasoned Action Approach, *The Annals of the American Academy of Political and Social Science*, 2012;640(1):11-27.

Ayu, A.M. & Ulung, A.K., Efektivitas Program Kerja Sama Unaids-Indonesia Tentang Hiv/Aids Melalui Media Sosial Instagram@ Tanya Marlo, *Jurnal Netnografi Komunikasi*, 2023;1(2):81-89.

Dewi, A., Supodo, T. & Kartini, K., The Relationship between Support of Husband and Health Officers and Hiv Testing in Pregnant Mothers in Kendari City Health Centre: Hiv Testing in Pregnant Mothers, *INDONESIAN JOURNAL OF HEALTH SCIENCES RESEARCH AND DEVELOPMENT (IJHSRD)*, 2021;3(2):178-184.

Famil, M., Analysis of Hiv/Aids Health Problems in Pacitan District East Java 2020, *Indonesian Journal of Tropical and Infectious Disease*, 2021;9(3):143.

Heath, K., Levi, J. & Hill, A., The Joint United Nations Programme on Hiv/Aids 95–95–95 Targets: Worldwide Clinical and Cost Benefits of Generic Manufacture, *Aids*, 2021;35(Supplement 2):S197-S203.

Hung, T.-C., Lu, L.-C., Lin, M.-H., Hu, Y.-C., Cheng, C.-Y., Cheng, S.-H. & Lee, C.-Y., Characteristics of Hiv-Positive Pregnant Women and Hiv- and Antiretroviral Therapy-Exposed Fetuses: A Case-Control Study, *The Journal of Infection in Developing Countries*, 2020;14(08):901-907.

Hutagaol, I.O., The Effect of Organizational Development and Work Behavior Towards the Role of Midwives in Prevention Mother Actions to Child Transmission (Pmtct) and Independence Care of Pregnant Women in the Pandemic Time Covid-19, 2022.

Irmayati, N., Yona, S. & Waluyo, A., Hiv-Related Stigma, Knowledge About Hiv, Hiv Risk Behavior and Hiv Testing Motivation among Women in Lampung, Indonesia, *Enfermeria Clinica*, 2019;29:546-550.

Omonaiye, O., Kusljic, S., Nicholson, P. & Manias, E., Medication Adherence in Pregnant Women with Human Immunodeficiency Virus Receiving Antiretroviral Therapy in Sub-Saharan Africa: A Systematic Review, *BMC public health*, 2018;18:1-20.

Putri, A.P., Am, A.I. & Padua, M.R., Penerimaan Diri Wanita Hamil Dengan Hiv Positif, *Riset Informasi Kesehatan*, 2021;10(1):80-88.

Sekar, P.G., Sukmawati, I.N., Arief, F. & Adriyanti, J.D., Pregnant Women's Factor toward Motherto-Child Transmission of Hiv Practice, *Saintika Medika*, 2021;17(2):191-203.

Simangunsong, D.E., Sianipar, K. & Purba, J., Perilaku Dan Persepsi Keyakinan Ibu Hamil Terhadap Screening Hiv Di Kota Pematangsiantar, *Jurnal Penelitian Kesehatan" SUARA FORIKES"(Journal of Health Research" Forikes Voice")*, 2020;11(2):202-207.

Syagran, E. & Setianto, B., Journal for Quality in Public Health Issn: 2614-4913 (Print), 2614-4921 (Online) Vol. 5, No. 1, November 2021, Pp: 231-236, 2021.

Ulfah, N., Sartika, S. & Septiyanti, S., Pelaksanaan Pelayanan Prevention of Mother-to-Child Hiv Transmission Dalam Pencegahan Penularan Hiv

Di Puskesmas Jumpandang Baru Makassar, *Jurnal Penelitian Kesehatan" SUARA FORIKES"(Journal of Health Research" Forikes Voice")*, 2020;12:53-59.

Wardhani, R.K., Dinastiti, V.B. & Azizah, E.N., Hubungan Pengetahuan Ibu Hamil Tentang Hiv Dengan Minat Untuk Periksa Hiv (Pmtct), *Jurnal Kebidanan Midwiferia*, 2019;5(1):28-35.

Widayanti, L.P., Evaluasi Pmtct (Prevention Mother to Child Transmission) Pada Irt Dengan Hiv Di Jatim, *Journal of Health Science and Prevention*, 2020;4(1):32-41.

THE EFFECT OF CONSUMING RED GUAVA ON INCREASING HEMOGLOBIN LEVELS IN PREGNANT WOMEN

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ABSTRACT

One of the global targets is the effort to reduce maternal mortality rates. In 2020, there were 4,627 maternal deaths recorded, caused by bleeding (28.29%), hypertension (23%), and circulatory system disorders (4.94%). The primary cause of maternal death is bleeding. This study aims to determine the effect of consuming red guava seeds on the increase in hemoglobin levels in pregnant women. The research method used is a quasi-experimental design with a one-group pretest-posttest design. The study was conducted at the KIA Clinic of UPTD Seunuddon Health Center in North Aceh Regency from June 3, 2024, to June 14, 2024, with a sample size of 47, using non-probability sampling, specifically accidental sampling. The results obtained from the paired sample test before and after consuming red guava seeds showed a sig (2-tailed) value of $0.000 < 0.05$, indicating that there is an effect of consuming red guava seeds on increasing hemoglobin levels in pregnant women at the KIA Clinic of UPTD Seunuddon Health Center, North Aceh Regency. The researcher concludes that consuming red guava seeds can increase hemoglobin levels in pregnant women.

Keywords: Guava Seeds, Anemia, Hemoglobin, pregnant Women

INTRODUCTION

Anemia is a condition where red blood cells function to carry oxygen into the bloodstream so that the body's physiological processes are disrupted. The hemodulation process in pregnancy causes a decrease in HB levels during pregnancy to <11mg/dL.

The incidence of anemia in pregnancy can increase the risk of death during the birth process and have an impact on the fetus, such as being susceptible to infection, low birth weight, and the risk of premature birth. Efforts to prevent this can be done by checking the HB levels of pregnant women at gestational age entering the third trimester. The occurrence of anemia in pregnancy causes the muscles of the uterus to weaken so that after delivery it takes a long time to close again.

One of the global targets is efforts to reduce maternal mortality (MMR). The World Health Organization (WHO) states that the maternal mortality rate that occurs during pregnancy, childbirth and postpartum is an indicator of women's health status (WHO, 2019). In 2020, 4,627 maternal deaths were recorded which were caused by bleeding (28.29%), hypertension (23%), and circulatory system disorders (4.94%).

The number of maternal deaths compiled from family health program records at the Ministry of Health in 2020 showed 4,627 deaths in Indonesia. This number shows an increase compared to 2019 of 4,221 deaths. Based on causes, the majority of maternal deaths in 2020 were caused by bleeding with 1,330 cases, hypertension in pregnancy with 1,110 cases, and circulatory system disorders with 230 cases (Ministry of Health of the Republic of Indonesia, 2020)

The Maternal Mortality Rate (MMR) in Aceh province in 2017-2021 is 223 per 100,000 live births, while the MMR in Banda Aceh City in 2021 is 6 per 100,000 live births. This occurs due to other causes in pregnant, giving birth and postpartum women at high risk over the age of 35 years (Wahyuni, & Sari 2023).

Research by Winarni, et al (2020) shows that there is a difference in the increase in Hb levels after being given red guava juice combined with blood supplement tablets compared to spinach and guava juice. There is a positive relationship regarding the increase in Hb after being given red guava juice. This is supported by research by Yulyana (2019) showing that there was an increase in the average HB levels of pregnant women after being given guava juice compared to red spinach juice.

A preliminary study conducted by researchers at the Tunas Harapan Community Health Center in 2021 of 182 pregnant women who were checked for Hb, there were 78 pregnant women who experienced anemia, namely 42.8%. The aim of the research was to determine whether there was an effect of consuming red guava on increasing hemoglobin levels in pregnant women at the KIA UPTD Polyclinic, Seunuddon Health Center, North Aceh Regency.

METHODS

The type of research used is quasi-experimental research, namely research by carrying out experimental activities, which aims to determine the symptoms or effects that arise as a result of certain treatments or experiments (Notoatmodjo, 2017). The design used is "One Group PreTest Post Test Design".

This research was carried out at the UPTD of the Seunuddon Community Health Center, North Aceh Regency, 3-14 June 2024. The sample used in this study was 47 people with inclusion criteria 1) Pregnant women with low hemoglobin levels in the blood. 2) Willing to participate and willing to fill out the questionnaire. And the exclusion criteria are 1) Pregnant women who have other illnesses or limitations in the form of psychology. 2) Not willing to participate and not willing to fill out the questionnaire. Data collection in this research was a questionnaire. The data analysis used in this research was the Paired T-test.

RESULTS AND DISCUSSION

Research entitled the effect of consuming red guava on increasing hemoglobin levels in pregnant women at the KIA UPTD Polyclinic, Seunuddon Community Health Center, North Aceh Regency, was conducted from 03 June 2024 to 14 June 2024. The sample in this study consisted of 47 pregnant women.

A. Univariate Analysis
1. Respondent Characteristics

Table I

Distribution of Age Characteristics of Pregnant Women at the UPTD KIA Polyclinic Seunuddon Community Health Center, North Aceh Regency

No	Characteristics	Frekuensi	Persentase (%)
1	**Age**		
	- 21 - 30 year	36	76,6

-	31 - 40 year	11	23,4
	Amount	**47**	**100**

Based on table 1, most of the respondents were aged 21-30 years, namely 36 respondents (76.6%), while those aged 31-40 years were 11 respondents (23.4%).

2. Frequency Distribution Before Consuming Red Guava by Pregnant Women

Table 2

Frequency Distribution Before Consuming Red Guava by Pregnant Women at the KIA Poly UPTD Seunuddon Health Center North Aceh Regency

No	HB levels	F	%
1	Normal	10	21,3
2	Mild Anemia	28	
3	Moderate Anemia	9	59,6
4	Severe Anemia	0	19,1
			0
	Amount	**47**	**100**

Based on table 2, the results showed that hemoglobin levels in pregnant women before consuming red guava were in the normal category as many as 10 respondents (21.3%), mild anemia as many as 28 respondents (59.6%), moderate anemia as many as 9 respondents (19.1%). %).

3. Frequency Distribution After Consuming Red Guava by Pregnant Women

Table 3

Frequency Distribution After Consuming Red Guava by Pregnant Women at the KIA Poly UPTD Seunuddon Health Center North Aceh Regency

No	HB levels	F	%
1	Normal	35	74,5
2	Mild Anemia	12	
3		0	

4	Moderate Anemia	0	25,5
	Severe Anemia		0
			0
	Amount	**47**	**100**

Based on table 3, the results show that hemoglobin levels in pregnant women after consuming red guava are in the normal category for 35 respondents (74.5%), with mild anemia for 12 respondents (25.5%).

B. Bivariate Analysis
1. Normality

Table 4
Normality

	N	Mean	Std. Deviasi	Asymps Sig (2-tailed)
Table	94	10,95	,74	0.973

Based on table 4, it can be seen that Asympps Sig (2-tailed) is 0.973 > more than 0.05, which means the data is normally distributed.

Table 5
Increased Hemoglobin Levels in Pregnant Women After Consuming Red Guava

	N	Mean	Std. Deviasi	P Value
Pretest	47	10,45	,521	0.000
Posttest	47	11,45	,571	

Based on table 4.5, it can be concluded that the results of the paired sample test before and after consuming red guava, obtained a sig value (2-tailed) = 0.000 < 0.05, which means that there is an effect of consuming red guava on increasing hemoglobin levels in pregnant women at the Polyclinic. KIA UPTD Seunuddon Community Health Center, North Aceh Regency.

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CONCLUSION

The effect of consuming red guava on increasing hemoglobin levels in pregnant women at the KIA UPTD Polyclinic, Seunuddon Health Center, North Aceh Regency

Based on the research results, the results of paired sample tests were obtained before and after consuming red guava. The sig value (2-tailed) = 0.000 < 0.05, which means that there is an effect of consuming red guava on increasing hemoglobin levels in pregnant women at the UPTD KIA Polyclinic. Seunuddon Community Health Center, North Aceh Regency.

Hemoglobin according to Herlina and Djamilus (2018) is an oxygen-carrying metalprotein containing iron in red cells in the blood of mammals and other animals. The hemoglobin molecule consists of globin, apoprotein and four heme groups, an organic molecule with one iron atom. Hemoglobin examination and monitoring can be done using the Sahli tool. Blood tests are carried out at least twice during pregnancy, namely in the first trimester and third trimester.

A pregnant woman who has an Hb level of less than 10 gr% according to Herlina and Djamilus (2018) is said to suffer from anemia in pregnancy. Anemia in pregnancy or lack of hemoglobin levels in the blood can cause more serious complications for the mother in pregnancy, childbirth and postpartum, namely it can result in abortion, premature parturition, prolonged labor due to uterine inertia, post partum bleeding due to uterine atony, shock, intra partum infection. or post partum. Severe anemia with Hb less than 4 gr% can result in decompensation cordis. Meanwhile, complications can occur in the products of conception, namely early death, perinatal death, prematurity, congenital defects and insufficient iron reserves.

Efforts to increase hemoglobin levels in pregnant women and administering Fe tablets can also be combined with complementary therapies derived from herbs, one of which is consuming red guava juice. In terms of vitamin C concentration, guava fruit is unmatched. Ascorbic acid levels in guava are approximately 87 milligrams per 100 grams, making it much higher than oranges. Guava has 49 calories, 0.9 grams of protein, 0.3 grams of fat, 12.2 grams of carbohydrates, 14 milligrams of calcium, 28 milligrams of phosphorus, 1.1 milligrams of iron, 25 IU of vitamin A, 0.05 milligrams of vitamin B1 and 86 grams of air per 100 grams. Furthermore, the vitamin C contained in guava increases the absorption of iron by the body. Therefore, the body is expected to be able to absorb iron optimally and increase hemoglobin levels (Yusnaini, 2014).

Red guava juice which is rich in iron can treat anemia in pregnant women and helps iron absorption. Vitamin C helps iron absorption by converting iron ($Fe3+$) to iron ($Fe2+$) in the small intestine, making foods high in iron more easily absorbed. A further decrease in pH will occur if gastric pH decreases. Iron absorption can be increased by as much as 30% thanks to vitamin C's ability to increase gastric pH. Furthermore, L-ascorbic acid helps transport by suppressing plasma transferrin to liver ferritin. According to Augustina, Indrayani, and Suralaga (2022), most of the transferrin in the blood is responsible for transporting iron to the bone marrow for storage and use by the body.

This is in accordance with the results of research conducted by Tyastuti (2019) entitled giving guava on hemoglobin levels in adolescent girls who experience anemia at SMAN 1 Bergas, Semarang Regency. The results showed changes in hemoglobin levels between the 3 treatment groups, the positive control group and the negative control group (p= 0.022) using the Krustall Wallis Test. The highest change in hemoglobin levels in the treatment group was that before the intervention the average hemoglobin level was 10.92 g/dl to 12.27 g/dl (t= 4.768, p= 0.001) with the paired t-test, so there was an effect giving guava juice to the hemoglobin levels of adolescent girls who suffer from anemia. One fruit that can increase hemoglobin levels is guava. The chemical content in guava is amino acids (tryptophan, lysine), calcium, phosphorus, iron, sulfur, vitamin A, vitamin B1, and vitamin C. The mineral content is Guava fruit can treat anemia sufferers (lack of red blood) because red guava fruit also contains minerals that can facilitate the process of forming hemoglobin in red blood cells. Mineral content such as magnesium, copper and manganese. Manganese is used by the body as a co-factor for the antioxidant enzyme, superoxide dismutase. Copper is needed in the production of red blood cells, this is in accordance with the opinion of Muhlisah (2010) which is supported by the opinion of Indah (2012)

ACKNOWLEDGEMENT

REFERENCES

Arania, R., Triwahyuni, T., Esfandiari, F., & Nugraha, F. R. (2021). Hubungan antara usia, jenis kelamin, dan tingkat pendidikan dengan kejadian diabetes mellitus di Klinik Mardi Waluyo Lampung Tengah. *Jurnal Medika Malahayati*, *5*(3), 146-153

Ardilla, A. (2023). Pengaruh Pemberian Jus Nanas Terhadap Percepatan Penyembuhan Luka Perineum Pada Ibu Nifas Di Wilayah Kerja Puskesmas Langsa Barat. *Darussalam Indonesian Journal fo Nursing and Midwifery*, *5*(1), 129-139.

Allamanda, D. S. (2019). *Penerapan Edukasi Perubahan Fisiologis Ibu Hamil Trimester 3 terhadap Ny E G2P1A0 di PMB Emalia Kalianda Lampung Selatan* (Doctoral dissertation, Poltekkes Tanjungkarang).

Amalia, N., & Yusnia, N. (2021). Hubungan Pengetahuan Kesehatan Reproduksi Remaja Mengenai Penggunaan Pantyliner Dengan Kejadian Keputihan. *Journal of Nursing Practice And Education*, *2*(1), 61-68. https://doi.org/10.34305/jnpe.v2i1.360

ANNIS, S. H. (2021). *Pengaruh Variasi Volume Sari Buah Jambu Biji (Psidium Guajava L.) Varietas Kristal Terhadap Berat Lateks* (Doctoral Dissertation, UIN RADEN INTAN LAMPUNG).

Antono, S. D. (2017). Hubungan frekuensi antenatal care dengan kejadian anemia pada ibu hamil trimester III di RSUD Nganjuk tahun 2017. *Jurnal Ilmu Kesehatan*, *6*(1), 32-38. https://doi.org/10.32831/jik.v6i1.152

Aryanti, A., & Karneli, K. (2020). Hubungan Dukungan Suami pada Ibu Hamil Terhadap Kunjungan Antenatal Care (ANC) Di BPM Soraya Palembang. *Cendekia Medika: Jurnal Stikes Al-Maarif Baturaja*, *5*(2), 94-100. https://doi.org/10.52235/cendekiamedika.v5i2.68

Barokah, R. (2015). *Pengaruh Waktu Penyimpanan Terhadap Kadar Vitamin C Pada Jambu Biji Merah (Psidium Guajava)(Studi Di Pasar Legi Jombang–East Java)* (Doctoral dissertation, STIKes Insan Cendekia Medika Jombang).

Bambang, A. W. (2021). *Perbandingan Deteksi Keberadaan Infeksi Uretritis Gonore Dan Uretritis Non Gonore Dari Sampel Dinding Vagina Dan Serviks Menggunakan Metode Pcr Pada Pekerja Seks Komersial Di Makassar* (Doctoral dissertation, Universitas Hasanuddin) http://repository.unhas.ac.id/id/eprint/5881/

Carolin, B. T., & Novelia, S. (2021). Penyuluhan dan Pemeriksaan Kadar Hemoglobin Sebagai Upaya Deteksi Dini Anemia Pada Ibu Hamil. *Journal of Community Engagement in Health*, *4*(1), 245-248.

Djuang, M. L. F. (2021). Hubungan Tindakan Vulva Hygiene dengan Kejadian Infeksi Saluran Kemih (ISK) pada Pasien Rawat Inap di RSU Mamami Kupang. *CHMK Midwifery Scientific Journal*, *4*(2), 268-277. http://cyber-chmk.net/ojs/index.php/bidan/article/view/1053

Dwiyanti, L. (2021). Pengaruh Pemberian Jambu Biji Merah Terhadap Jumlah Trombosit Pada Pasien Demam Berdarah Dengue.

Fitriani, I. A. (2021). *AKTIVITAS ANTIBAKTERI KULIT BUAH JAMBU BIJI (Psidium guajava L.) TERHADAP BAKTERI Streptococcus pyogenes* (Doctoral dissertation, Akademi Farmasi Putra Indonesia Malang).

Hamid, M. A., Irawan, B., & Ruriawan, M. F. (2020). Perancangan Aplikasi Deteksi Dini Penyakit Anemia Menggunakan Sistem Pakar Dengan Metode Forward Chaining Berbasis Android. *eProceedings of Engineering*, *7*(1).

Hardiani, R. S., & Purwanti, A. (2015). Motivasi dan Kepatuhan Kunjungan Antenatal Care (ANC) Pada Ibu Hamil Trimester III. *Jurnal Keperawatan*, *3*(2). https://doi.org/10.22219/jk.v3i2.2595

Hanifah, D. (2020). *Pengembangan Bahan Ajar Siswa Materi Peredaran Darah Manusia Untuk Mereduksi Miskonsepsi* (Doctoral dissertation, Universitas Muhammadiyah Gresik).

Herdiani, T. N., Fitriani, D., Sari, R. M., & Ulandari, V. (2019). Manfaat Pemberian Jus Jambu Biji Terhadap Kenaikan Nilai Kadar Hemoglobin Pada Ibu Hamil. *Jurnal SMART Kebidanan*, *6*(2), 101.

Irawan, A., Syaifudin, M., & Amin, M. (2019). Penambahan ekstrak daun jambu biji daging buah merah (Psidium guajava var. pomifera) untuk transportasi ikan mas (Cyprinus carpio) sistem basah. *Jurnal Akuakultur Rawa Indonesia*, *7*(2), 135-148.

Istiana, S., Mulyanti, L., & Janah, A. (2021). Pendidikan Kesehatan tentang Vulva Hygiene pada Wanita Usia Subur di Dusun Teseh Kelurahan Meteseh Kecamatan Tembalang Kota Semarang. *Jurnal Pengabdian Masyarakat Kebidanan*, *3*(2), 39-44 https://doi.org/10.26714/jpmk.v3i2.7860.

Lestari, L., & Zulkarnain, Z. (2021, November). Diabetes Melitus: Review etiologi, patofisiologi, gejala, penyebab, cara pemeriksaan, cara pengobatan dan cara pencegahan. In *Prosiding Seminar Nasional Biologi* (Vol. 7, No. 1, pp. 237-241).

Restuti, A. N. S., Yulianti, A., & Lindawati, D. (2020). Efek minuman cokelat (Theobroma cacao L.) terhadap peningkatan jumlah eritrosit dan kadar hemoglobin tikus putih anemia. *Jurnal Gizi Indonesia (The Indonesian Journal of Nutrition)*, *8*(2), 79-84.

Sari, R. N. (2022). *Asuhan Keperawatan Dengan Gangguan Kebutuhansirkulasi Pada Pasien Dengan Anemia Di Ruangpenyakit*

Dalambrsud Jenderal Ahmad Yani Kotametro Lampung Tahun 2022 (Doctoral dissertation, Poltekkes Tanjungkarang).

Satria, E. (2020). Hubungan Berat Badan Lahir Bayi Dengan Berat Plasenta Di Praktek Bidan Bersama Wilayah Kerja Puskesmas Nanggalo Kota Padang. *Jurnal Amanah Kesehatan*, *2*(2), 19-26.

Sari, J. D. R. (2019). *Gambaran Kadar Laju Endap Darah dan Hemoglobin Pada Petugas Security di Daerah Sutorejo Surabaya* (Doctoral dissertation, Universitas Muhammadiyah Surabaya).

Sari, D. D. N. (2020). Asuhan Kebidanan Terintegrasi pada Ny B Umur 33 Tahun di Puskesmas Sibela Surakarta. https://digilib.uns.ac.id/dokumen/detail/79929/

Solang, S., Lohoraung, A., & Purwandari, A. (2012). Hubungan kepuasan pelayanan antenatal care dengan frekuensi kunjungan ibu hamil di Puskesmas Kombos Kecamatan Singkil Kota Manado. *Jurnal Gizido*, *4*(1), 349-357.

Surati, S., & Manurung, B. (2023). Pengaruh Senam Hamil Terhadap Pengurangan Nyeri Punggung Pada Ibu Hamil Di Praktek Mandiri Bidan Elisabeth Kabupaten Mandailing Natal Tahun 2022. *Jurnal Rumpun Ilmu Kesehatan*, *3*(1), 01-05.

Sugiono, P. D. (2014). Metode penelitian pendidikan pendekatan kuantitatif. pdf. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif Dan R&D*, *12*, 42.

Wahyuni, S., & Sari, M. A. (2023). Faktor-Faktor Yang Berhubungan Dengan Kejadian Abortus Inkomplit Di Rumah Sakit Bhayangkara Polda Aceh Kota Banda Aceh. *JURNAL ILMIAH OBSGIN: Jurnal Ilmiah Ilmu Kebidanan & Kandungan P-ISSN: 1979-3340 e-ISSN: 2685-7987*, *15*(2), 383-395. https://doi.org/10.36089/job.v15i2.1266

Wigati, P. W., & Firdaus, N. (2018). Pengaruh pemberian kombinasi jus bayam dan jambu biji terhadap kadar hemoglobin pada ibu hamil di wilayah kerja Puskesmas Balowerti Kota Kediri. *Journal for Quality in Women's Health*, *1*(2), 7-10. https://jqwh.org/index.php/JQWH/article/view/10

Wijayanti, H., Wulandari, D. A., & Melyani, M. (2021). Perbedaan efektivitas antara pemberian jus tomat dengan jus jambu biji merah terhadap kadar hemoglobin pada ibu hamil trimester III di Puskesmas Hilir. *Jurnal Kesehatan*, *14*(2), 71-75.

PERFORMANCE EVALUATION OF ISLAMIC ARTIFICIAL INTELLIGENCE IN THE MUSLIM PRO APPLICATION: A SYSTEMATIC REVIEW

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ABSTRACT

This research aims to examine the performance of Islamic AI in the Muslim Pro Application in providing accurate answers related to Islamic teachings. This literature study analyzes various previous studies that evaluated the ability of the Muslim Pro Application to deliver correct and reliable information to users. The main focus of this research is to assess the accuracy of answers provided by the Islamic AI of the Muslim Pro Application and compare them with traditional sources of religious knowledge, such as Islamic scholars and texts. Findings indicate that the Islamic AI of the Muslim Pro application is capable of providing sufficiently accurate answers to basic questions about Islam. However, there are shortcomings in handling more complex questions, which require further verification from more authoritative sources. The study also found that most users are satisfied with the accuracy of the answers provided, but there is a need for further improvement, especially in terms of the depth and detail of the answers. This research recommends further development of AI algorithms and collaboration with Islamic scholars to improve the quality of answers provided by the Islamic AI of the Muslim Pro Application.

Keywords: Islamic Muslim Pro Application, Islam, Literature Study

INTRODUCTION

Artificial intelligence (AI) technology has brought about a revolution in various aspects of human life, including in the religious domain. One Islamic application that utilizes this technology is Muslim Pro, designed to help Muslims lead their religious lives more easily (Zaini Miftach, 2023). Muslim Pro offers various features such as prayer times, call to prayer (Adhan), Qibla direction, community, Tasbih (prayer beads), nearby mosques, nearby halal places, Islamic Hijri calendar, the 99 Names of Allah (Asmaul Husna), Shahadah recitation, Zakat calculator, daily inspiration, news and media, supplications, messages, live Mecca broadcast, popular verses, and AI Muslim Pro that can answer questions related to Islamic teachings (Sukma et al., 2019). This Islamic AI feature of the Muslim Pro Application is designed to provide quick and accurate answers, replacing or complementing the role of traditional sources such as Islamic scholars and religious texts.

As technology advances, the need for quick and easily accessible information is increasing (Yahya et al., 2023). In the midst of fast-paced lifestyles, many people seek instant answers to their religious questions. The Islamic AI of the Muslim Pro Application is here to meet this need by offering instant answers that can be accessed anytime and anywhere. However, there are significant challenges regarding the accuracy and reliability of answers provided by this Muslim Pro Application. In the context of religion, where information accuracy is crucial, errors in providing answers could have serious consequences and lead to misunderstandings.

Traditional sources such as Islamic scholars and religious texts have long been the primary reference for Muslims seeking answers to religious questions. Scholars, with their deep knowledge and experience, are able to provide comprehensive and trustworthy answers. Islamic texts, containing teachings and interpretations that have stood the test of time, also provide clear and authoritative guidance. Therefore, it is important to evaluate the extent to which the Islamic AI of the Muslim Pro Application can provide answers as accurate and comprehensive as these traditional sources.

The main problem faced by the Islamic AI of the Muslim Pro Application is how to ensure that the answers provided are accurate and in accordance with Islamic teachings. Although AI has great potential in processing and delivering information, this technology still relies on the data used to train it. If the data is inaccurate or incomplete, then the answers provided by the Muslim Pro Application will also be affected. Additionally, the Muslim Pro Application may struggle in handling more complex questions that require in-depth interpretation or specific cultural and historical context.

Besides accuracy, there are other aspects to consider, namely relevance and user satisfaction. Users expect answers that are not only accurate but also relevant to the context of their questions. User satisfaction is an important indicator for assessing the success of a technology. If users are satisfied with

the answers provided by the Muslim Pro Application, then the technology can be considered successful in achieving its goals.

The success of the Islamic AI of the Muslim Pro Application in providing accurate answers greatly depends on the quality of data used to train it. High-quality and comprehensive data can help the Muslim Pro Application provide more accurate and relevant answers. Therefore, Muslim Pro Application developers must work with religious experts and use recognized sources to ensure that the data used is accurate and reliable.

Several previous studies have evaluated the performance of AI in religious contexts. For example, some studies show that AI can be used to support religious education and understanding, but the main challenge is ensuring the accuracy and relevance of the answers provided. Other research indicates that user satisfaction heavily depends on the accuracy of information provided by AI. In the context of Muslim Pro, this research will explore how this Muslim Pro Application is designed and implemented, as well as the extent of accuracy and relevance of the answers provided.

Moreover, there are ethical challenges that must be considered in the development and use of AI in religious contexts. The Muslim Pro Application must be designed with consideration for the values and principles respected by Muslims. Errors or misuse of AI in this context can lead to controversy and damage user trust in the technology. Therefore, AI developers must work with religious communities to ensure that the Muslim Pro Application is designed and used in a way that respects and supports religious teachings.

This research is expected to make a significant contribution to academic literature in the fields of AI technology and religious studies. By choosing this title, this research focuses on important and relevant aspects in both fields, offering an in-depth and comprehensive analysis of the performance of the Muslim Pro Application in providing answers about Islamic teachings.

RESEARCH METHODOLOGY

The research method used to evaluate the performance of the Islamic AI in the Muslim Pro Application in providing accurate answers about Islamic teachings. This research uses a comprehensive literature study method, which includes collecting, analyzing, and synthesizing information from various relevant sources. This section also includes an explanation of data collection techniques, data analysis techniques, and findings validation procedures.

Data Sources
Data sources used in this research include:
1. **Journal Articles**: Articles published in scientific journals related to artificial intelligence, Islamic studies, and information technology.
2. **Books**: Books discussing AI development, AI applications in religious contexts, and Islamic studies.

3. **Research Reports**: Research reports published by academic institutions and research organizations.
4. **Online Sources**: Credible online sources, such as official websites, scientific articles, and conference papers.

Source Selection Criteria

Selected sources must meet the following criteria:
1. **Relevance**: Sources must be relevant to the research topic, namely the performance of Islamic AI in the Muslim Pro Application in providing answers about Islamic teachings.
2. **Credibility**: Sources must come from trusted and recognized publications in their field.
3. **Currency**: Sources used should be as recent as possible to ensure that the information obtained aligns with the latest developments in AI technology and Islamic studies.

Data Collection Technique

Data is collected through searches in various academic databases and digital libraries using relevant keywords, such as "Muslim Pro Application", "Muslim Pro", "accuracy", "artificial intelligence in religion", and other combinations. Databases used include Google Scholar, PubMed, IEEE Xplore, and other digital libraries.

Data Analysis Technique
Data Categorization and Organization

Collected data is then categorized and organized based on relevant topics and themes. Some main categories used in the analysis include:
- **Accuracy of Muslim Pro Application Answers**: Evaluation of the accuracy of answers provided by the Muslim Pro Application in the context of Islamic teachings.
- **Comparison with Traditional Sources**: Comparison between answers from the Muslim Pro Application and answers from traditional sources such as Islamic scholars and Islamic texts.
- **User Satisfaction**: Analysis of the level of user satisfaction with the answers provided by the Muslim Pro Application.

Analysis Techniques
- **Thematic Analysis**: This technique is used to identify main themes that emerge from the reviewed literature.
- **Comparative Analysis**: This technique is used to compare answers provided by the Muslim Pro Application with answers from traditional sources.

- **Meta-Analysis**: If adequate quantitative data is available, meta-analysis techniques are used to combine results from various studies to obtain stronger conclusions.

Findings Validation
Peer Review

Research results and main findings will be validated through a peer review process. This process involves reviews from experts in the fields of AI technology and Islamic studies to ensure that the analysis and conclusions made are accurate and reliable.

Expert Consultation

In addition to peer review, consultation with experts is also conducted to gain additional insights and validation of research findings. Experts consulted include Islamic scholars, AI experts, and researchers in the field of religious technology.

RESEARCH RESULTS

In the context of using the Islamic AI Muslim Pro Application to provide answers about Islamic teachings, the accuracy of information provided by this technology becomes crucial. This research evaluates the accuracy of the Muslim Pro Application in several main aspects, such as prayer times, Qibla direction, worship procedures, and interpretation of Quranic verses. The following is an analysis based on data from various relevant literature sources.

1. **Prayer Times and Qibla Direction**

The Islamic AI Muslim Pro Application is often relied upon by users to provide information about accurate prayer times and Qibla direction. Various studies show that the Muslim Pro Application can provide this information with a high level of accuracy (Qistina, 2022). Based on the applied algorithm, the Muslim Pro Application is able to calculate prayer times accurately based on the user's location, as well as determine the Qibla direction using sensors in supporting devices (Qistina, 2022).

However, this accuracy also depends on the available input data, such as geographic coordinates or precise time settings. Further research shows that when location data or sensors are inaccurate or disrupted, the Muslim Pro Application may provide less accurate information, although in most cases, this does not often occur with advanced technology.

Picture 1. Qibla Platform

Picture 2. Prayer Platform

2. **Worship Procedures**

In daily religious practices, users of the Muslim Pro Application often seek guidance on worship procedures such as how to perform prayers, fasting, zakat, and hajj. Literature studies show that the Muslim Pro Application can provide fairly complete and accurate guidance on these worship procedures. The information provided tends to be in accordance with Islamic teachings generally accepted by the majority of Muslims.

Picture 3. Menu of Muslim Pro Aplication

However, the accuracy of the Muslim Pro Application in providing this guidance can also be influenced by the quality of content and data used in its development. The Muslim Pro Application tends to be better at providing clear and direct answers related to standard worship procedures. When facing uncommon questions or situations that require deeper interpretation, the Muslim Pro Application's performance may decline (Rohmawaty et al., 2023).

3. **Interpretation of Quranic Verses**

The Islamic AI Muslim Pro Application is also used to provide interpretation or tafsir of Quranic verses. Research shows that the Muslim Pro Application can provide quite varied interpretations depending on the data sources and algorithms used. The Muslim Pro Application tends to provide very literal interpretations related to generally accepted interpretations in Islamic literature.

However, in the case of complex verses or those requiring a deep understanding of historical and cultural contexts, the accuracy of

the Muslim Pro Application can be questioned. Some users say that the Muslim Pro Application has limitations in providing in-depth interpretations or in specific contexts.

4. Variability of Accuracy Based on Question Complexity

One important finding in this research is that the accuracy of the Muslim Pro Application tends to vary depending on the complexity of the questions asked and the availability of input data. Simple and general questions tend to be answered with a high degree of accuracy by the Muslim Pro Application, especially if the answers can be obtained from data available in the Muslim Pro Application's knowledge base (Rohmawaty et al., 2023).

However, when faced with questions that require deep understanding or complex interpretation, the Muslim Pro Application may experience difficulties in providing satisfactory answers. For example, questions about controversial religious issues or situations that require moral and ethical judgments often require more than just algorithms or knowledge bases (Wati, 2023).
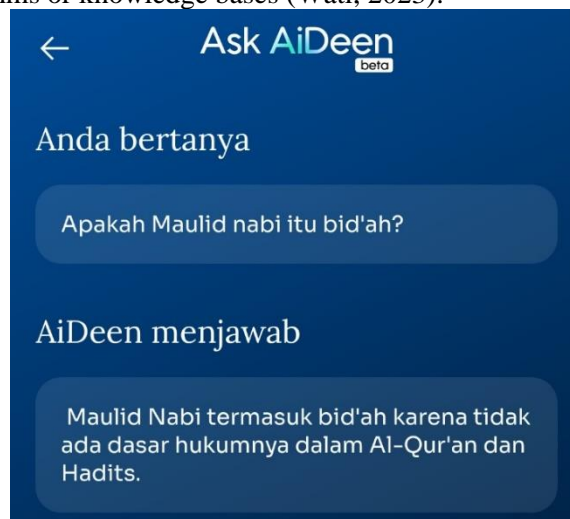
Picture 4. Ask AiDeen

One of the answers from Ask AiDeen about the Prophet's Mawlid being bid'ah is supported by Ibn Taymiyyah's opinion that the celebration of Mawlid is a bid'ah practice. The celebration is not allowed because the Salaf group did not celebrate it and there is no textual source that allows this practice (Farid & Sharif, 2017). Meanwhile, some scholars and Muslim groups do allow this celebration for reasons: (1) As an expression of love and respect for Prophet Muhammad. (2) As a means of da'wah and reminder of Islamic

history. (3) Considered as a cultural tradition that does not conflict with Islamic teachings as long as it does not contain elements of shirk. (4) Based on hadith mentioning that the Prophet fasted on the day of his birth (Hasan, 2015).

Based on analysis from various literature sources, the Islamic AI Muslim Pro Application shows a good level of accuracy in providing answers about Islamic teachings, especially for practical information such as prayer times, Qibla direction, and worship procedures. However, this accuracy can vary depending on the complexity of the questions asked and the availability of input data.

To improve the accuracy of the Muslim Pro Application in providing answers about Islamic teachings, further attention is needed to develop more sophisticated algorithms, integrate more accurate data, and deepen understanding of cultural and historical contexts in religious contexts. In addition, it is also important to recognize that the Muslim Pro Application should be guided and supported by consultation with traditional sources such as scholars to ensure the accuracy and relevance of answers given to users.

Comparison of the Muslim Pro Application with Traditional Sources in Islamic Context: A Review from Literature Sources

In the context of using Muslim Pro Application technology to provide answers about Islamic teachings, it is important to compare the capabilities of the Muslim Pro Application with traditional sources such as Islamic scholars and texts. This comparison not only covers the speed and ease of providing information, but also the accuracy and depth of understanding possessed by both types of sources. The following is an analysis based on data from various relevant literature sources.

Speed and Accessibility of Information

Muslim Pro Applications like Muslim Pro are often relied upon for their ability to provide quick and direct answers. Users can easily ask questions about prayer times, Qibla direction, or worship procedures, and get instant answers without having to manually search for information or consult with scholars directly (Pro, 2024).

Literature studies show that the use of the Muslim Pro Application can save time for busy individuals or those living in areas where access to scholars or religious literature is not easy. This makes the Muslim Pro Application a practical and efficient solution to meet daily religious information needs (Khan et al., 2021).

Accuracy and Depth of Understanding

However, the accuracy and depth of understanding of the Muslim Pro Application is still debated in academic literature. Although the Muslim Pro Application can provide accurate answers to

standard and general questions, such as worship procedures or clear religious laws, this accuracy is often not comparable to the deep understanding possessed by scholars.

Islamic scholars and intellectuals have deep knowledge of sacred texts such as the Quran and Hadith, as well as a broad contextual understanding of the practical application of religious teachings in daily life. They are able to perform complex interpretations of Quranic verses or hadiths that may require understanding of history, culture, and social context at that time (Jannah et al., 2023).

Limitations of the Muslim Pro Application in the Context of Interpretation and Controversy

Research shows that the Muslim Pro Application tends to have limitations in dealing with controversial questions or issues that require in-depth interpretation. For example, in the case of interpreting complex sharia laws or fatwas on contemporary issues, the Muslim Pro Application may not be able to provide adequate answers due to limitations of algorithms or available knowledge bases (Sukma et al., 2019).

The Muslim Pro Application also tends to provide more literal answers related to existing rules, without being able to consider nuances or historical contexts that may be important in religious interpretation. This shows that although the Muslim Pro Application can provide practical answers, consultation with scholars is still needed for complex questions or those requiring in-depth interpretation (Sukma et al., 2019).

CONCLUSION

Based on the research findings, the conclusion highlights several key points regarding the performance and limitations of the Muslim Pro Application in providing answers about Islamic:

1. Speed and Accessibility: The Muslim Pro Application is praised for its ability to quickly provide direct answers to common religious queries, such as prayer times, Qibla direction, and basic worship procedures. This makes it a practical tool for users who need fast and accessible information.

2. Accuracy and Depth: While the application can provide accurate answers to general and straightforward questions, its accuracy and depth of understanding are often less reliable compared to traditional sources like Islamic scholars and texts. Scholars have a profound understanding of sacred texts and can interpret them with the necessary historical and cultural context, which the app struggles to match.

3. User Preferences: Users tend to use the Muslim Pro Application for simple and quick queries. However, for more complex issues requiring

authoritative religious interpretation, they prefer consulting scholars or referring to traditional texts.

4. Overall Value: The Muslim Pro Application is a valuable tool for meeting daily religious information needs efficiently. Nevertheless, it is essential to acknowledge its limitations and ensure that users seek scholarly advice for complex and in-depth religious questions to maintain adherence to correct religious values and principles

REFERENCES

Farid, M., & Sharif, M. (2017). *Perayaan Maulid Menurut Ibnu Taymiyyah dalam Iqtiḍā ' The Maulid Festival According to Ibnu Taymiyyah in Iqtiḍā '. 24*(1), 51–80.

Hasan, M. (2015). Nilai-nilai Pendidikan Islam dalam Maulid Nabi Muhammad SAW. *Al-Insyiroh: Jurnal Studi Keislaman*, *1*(1), 180–213. https://doi.org/10.35309/alinsyiroh.v1i1.3347

Jannah, C., Mustofa, M. K., & Al-Faruq, U. (2023). Pentingnya Memahami Tafsīr, Takwīl, dan Terjemah Al Qur'an: Menghindari Penafsiran yang Salah dan Kontroversial. *Madaniyah*, *13*(1), 111–122. https://doi.org/10.58410/madaniyah.v13i1.622

Khan, M., Imtiaz, S., Parvaiz, G. S., Hussain, A., & Bae, J. (2021). Integration of Internet-of-Things with Blockchain Technology to Enhance Humanitarian Logistics Performance. *IEEE Access*, *9*, 25422–25436. https://doi.org/10.1109/ACCESS.2021.3054771

Pro, T. M. (2024). *https://connect.muslimpro.com/2024/02/pesan-ramadan-dari-muslim-pro-mengintip-fitur-fitur-terbaru/*.

Qistina, Z. (2022). *Akurasi Aplikasi Android Muslim Pro dalam Menunjukkan Arah Kiblat Masjid-Masjid di Kecamatan Pamulang*. Universitas Islam Negeri Syarif Hidayatullah.

Rohmawaty, E. N., Islam, U., Maulana, N., Ibrahim, M., Islam, U., Maulana, N., & Ibrahim, M. (2023). *Efektifitas Aplikasi Al- Qur ' An (Muslim Pro) Terhadap Kemampuan Membaca Al- Qur ' An Mahasiswa Iain Kediri. 07*, 391–400.

Sukma, A. P., Nugroho, W. B., & Zuryani, N. (2019). Digitalisasi Al-Quran: Meninjau Batasan Antara yang Sakral dan yang Profan pada Aplikasi "Muslim Pro." *Jurnal Ilmiah Sosiologi*, *1*(1), 1–15.

Wati, A. S. (2023). *Pengaruh Penggunaan Aplikasi Muslim Pro Terhadap Perilaku Keagamaan Anggota Ikatan Mahasiswa Alumni Pondok Pesantren Darul Ulum Di Jember*.

Yahya, A., Udin, F., Adnan, H., Fadilla, N. T., & ... (2023). Pengaruh Aplikasi berbasis Agama Islam pada era Disrupsi. *... Agama, Sosial, Dan ...*, *1*, 250–264.

Zaini Miftach. (2023). Pengaruh Penggunaan Aplikasi Muslim Pro Sebagai Media Pembelajaran Terhadap Pemahaman Hukum Tajwid Siswa di MTsN Nurul Falah, Solok Selatan. *Jurnal Ilmu Pendidikan*, *1*(5).

FACTORS RELATED TO THE INCIDENT OF HYPERTENSION IN THE ELDERLY IN TEUPIN KUYUN VILLAGE, SEUNUDDON DISTRICT, NORTH ACEH DISTRICT, 2024

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ABSTRACT

Hypertension can be defined as persistent blood pressure where the systolic pressure is above 120 mmHg and the diastolic pressure is above 90 mmHg. This study aims to determine the factors associated with the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency. This research design uses *cross sectional*. In determining the sample using the total sampling technique. The number of samples taken was 42 respondents. The variables studied were age, hereditary history, salt consumption. Hypertension data was obtained through blood pressure measurements, age and salt consumption data were obtained through questionnaires. This research uses statistical tests *Chi-Square* with *p-value* (< 0.05). Based on the research results, it was found that 40 people (95%) of elderly respondents had hypertension, based on tests *Chi-Square value is obtained* $P=0.088$, which means there is no significant relationship between age and the incidence of hypertension. In the hereditary variable, 30 people (71%) were found. There are offspring who have hypertension, based on tests *Chi-Square value is obtained* $P=0.001$, which means there is a significant relationship between heredity and the incidence of hypertension. In the salt consumption variable, 35 people (83%) found Those who consumed more salt experienced hypertension, according to tests *Chi-Square value is obtained* $P=0.001$, which means there is a significant relationship between salt consumption and the incidence of hypertension.

Keywords: Hypertension, Elderly, Heredity, Salt consumption

INTRODUCTION

According to WHO (2020) Hypertension is a serious medical condition and can increase the risk of heart, brain, kidney and other diseases. Hypertension is the leading cause of premature death worldwide with more than 1 in 4 men and 1 in 5 women and more than one billion people experiencing the condition ((Putri et al., 2022)

The Ministry of Health (2018) stated that the prevalence of hypertension in Indonesia, obtained through questionnaires and blood pressure measurements, tends to be higher in low education groups and non-working groups, possibly due to ignorance about good eating patterns. Based on the analysis of hypertension, it was found that the national prevalence was 5.3 percent (men 6.0% and women 4.7%), urban areas (5.6%) were higher than urban areas (5.1 (Muslimah et al., 2023)

According to the Ministry of Health (2019), the death rate in Indonesia due to hypertension is 427,218 deaths. Hypertension based on age occurs in the age group 31-44 years (31.6%), age 45-54 years (45.3%), and mostly in the age group 55-64 years (55.2%) (Rizkiyanti & Trisnawati , 2021)

Aceh Health Office (2018) stated that the number of hypertension sufferers based on City Districts in Aceh Province was 8.72% Simeulu, 8.19% Aceh Singkil, 11.33% South Aceh, 4.94% Southeast Aceh, 8.21% East Aceh, 8.22% Central Aceh, 10.92 West Aceh, 8.21% Aceh Besar, 10.67% Pidie, 11% Bireuen, 10.29% North Aceh, 9.77% Southwest Aceh, 5.38% Gayo Lues, 9.41% Aceh Tamiang, 10.32% Nagan Raya, 11.54% Aceh Jaya, 9.94 % Bener Meriah, 9.31% Pidie Jaya, 8.35% Banda Aceh, 10.81% Sabang, 7.55% Langsa, 8.96% Lhokseumawe, 5.61% Subulussalam ((Muslimah et al., 2023)

Riskesdas (2018) states that as humans age, physiological functions will decrease due to the aging process so that various non-communicable diseases often appear in the elderly and elderly, one of which is hypertension. Hypertension is a non-communicable disease which is one of the main causes of death in the world (Oktaviana et al., 2022)

Hypertension is often referred to as *The Silent Killer* (silent killer) because usually sufferers do not know that they have hypertension and only find out that they have hypertension after complications occur. The consequences that occur if hypertension is not treated immediately include stroke, retinopathy, coronary heart disease and heart failure and chronic kidney disease (Kurniadi & Nurrahmani, 2014)

The impact of hypertension that is not treated properly will cause various complications. If it hits the heart, heart failure and coronary heart disease can occur, if it hits the kidneys, chronic kidney failure can occur, and if it hits the eyes, vision problems will occur. The various complications that may arise are very serious illnesses and have an impact on the sufferer's psychology because their quality of life is low, especially in cases of stroke, kidney failure and heart failure (Zaim Anshari, 2020)

Risk factors that can influence the occurrence of hypertension in a person are divided into two, namely risk factors that cannot be changed and risk factors that can be changed. Risk factors that cannot be changed include age, gender and genetics. Risk factors that can be changed are smoking, excessive salt consumption, obesity, lack of physical activity, excessive alcohol consumption, coffee consumption and stress. The occurrence of hypertension requires the interaction of various risk factors together (Ledoh et al., 2024)

The number of cases of hypertension in the elderly in Seunuddon District in 2022-2023 is 150 cases. Based on the results of a preliminary survey conducted on 10 respondents aged > 60 years in Teupin Kuyun Village, it was found that there were 10 elderly respondents who ate foods containing salt with a frequency of > 1 x / day or 3-6 x/week. And out of 10 there were 6 respondents who had a family history of hypertension, namely their mother and father.

METHODS

This type of research is analytical observational research using a research design *Crosssectional*. This research design is used to find the relationship between the independent variable (risk factor) and the dependent variable (effect) by taking momentary measurements (Aziz Alimul Hidayat, 2014).Location: This research was conducted in Teupin Kuyun Village, Seunoddon District, North Aceh Regency from March to July 2024. The samples in this study were all elderly people in Teupin Kuyun Village, Seunoddon District, using a sampling technique using the method *total sampling* totaling 42 people.

The variables in this research consist of dependent and independent variables. The dependent variable is the incidence of hypertension. The independent variables are Age, Heredity and Salt Consumption. Data collection methods to determine factors related to the incidence of hypertension in the elderly use tests *chi square.*

RESULTS AND DISCUSSION

1.   Respondent Characteristics

No	Characteristics	Frequency	%
1.	**Hypertension**		
	Yes	37 People	88 %
	No	5 People	12 %
	Total	42 People	100 %
2.	**Age**		
	Elderly	40 People	95 %
	Old Age	2 People	5 %
	Total	42 People	100 %
3.	**Ancestry History**		
	There is	30 People	71 %
	There isn't any	12 People	29 %
	Total	42 People	100 %
4.	**Salt Consumption**		
	Not enough	2 People	5 %
	Enough	5 People	12 %
	More	35 People	83 %
	Total	42 People	100 %

Based on table 1 above, it shows that the majority of elderly people studied were Yes, Hypertension, 37 people (88%), most of the people studied were elderly, 40 people (95%), most of those studied had a hereditary history, 30 people (71%) , the majority of those studied consumed excess salt, 35 people (83%).

2. **The relationship between age and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.**
    Table 2: Relationship between age and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.

Age	Hypertension Percentage (%)				P Value
	Yes	%	No	%	
Elderly	36	86 %	4	10%	0,088
Old Age	1	2%	1	2%	
Total	**37**	**88 %**	**5**	**12 %**	

Source: Research Data Processing Results, 2024

The results of the analysis of the relationship between the age factor and the incidence of hypertension in the elderly showed that of the 42 respondents, more elderly people experienced hypertension, namely 36 people (86%). Based on the table above using the Chi Square test, the statistical test results show that the value of $p = 0.088 > \alpha = 0.05$, which means that H0 is accepted and H1 is rejected, that there is no relationship between age and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, Aceh Regency. North.

2. **Relationship between heredity and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.**

    Table 3. Relationship between heredity and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.

Descendants	Hypertension Percentage (%)				P Value
	Yes	%	No	%	
Yes	30	71 %	0	0%	0,001
No	7	17%	5	12%	
Total	**37**	**88 %**	**5**	**12 %**	

Source: Research Data Processing Results, 2024

The results of the analysis of the relationship between hereditary factors and the incidence of hypertension in the elderly showed that of the 42 respondents, elderly people who experienced hypertension had more hereditary histories, namely 30 people (71%). Based on the table above using the Chi Square test, the results of the statistical test show that the value of $p = 0.001 > \alpha = 0.05$, which means that HI is accepted and Ho is rejected, that there is a relationship between hereditary history and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, Aceh Regency. North.

4. The relationship between salt consumption and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.

Table 4. Relationship between salt consumption and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, North Aceh Regency.

Salt Consumption	Hypertension Percentage (%)				P Value
	Yes	%	No	%	
Not enough	0	0 %	2	5%	0,001
Enough	3	7%	2	5%	
More	34	81%	1	2%	
Total	**37**	**88 %**	**5**	**12 %**	

Source: Research Data Processing Results, 2024

The results of the analysis of the relationship between salt consumption factors and the incidence of hypertension in the elderly showed that of the 42 respondents, elderly people who experienced hypertension consumed more salt, namely 34 people (81%). Based on the table above using the Chi Square test, the results of the statistical test show that the value of $p = 0.001 > \alpha = 0.05$, which means that HI is accepted and Ho is rejected, that there is a relationship between salt consumption and the incidence of hypertension in the elderly in Teupin Kuyun Village, Seunuddon District, Aceh Regency. North.

DISCUSSION
A. Relationship between age and the incidence of hypertension in the elderly
Based on the results of statistical tests using the test *Chi Square* showed that there was no significant relationship between age and the incidence of hypertension as proven by the results *p-value* = 0.088, this is not in line with research by Idha Kurniasih, et al, 2021 with a multivariate test and obtained a significance value (p=0.010), which means that there is a statistically significant relationship between age and the incidence of hypertension.

According to Kaplan, increasing a person's age will be accompanied by changes in the structure of large blood vessels, the lumen becomes narrower and the blood vessel walls become stiff, the result is an increase in systolic blood pressure. In essence, the prevalence of hypertension increases with age because the elderly require an increased blood condition to pump blood to the brain and other vital organs (Azhari, 2017)

B. Relationship between heredity and the incidence of hypertension in the elderly
Based on the results of statistical tests using the test *Chi Square* shows that there is a significant relationship between heredity and the incidence of hypertension as proven by the results *p-value* = 0,001.

The research results of Nanang et al., (2020) using statistical bivariate analysis tests revealed that of the 29 respondents who did not have hereditary factors, the majority experienced hypertension as many as 17 people (58.6%). Likewise, of the 59 respondents who had hereditary factors, the majority experienced hypertension, 48 people (81.4%). Using the Chi Square test, it shows p-value = 0.023, which is less than the significance value, namely 5% (0.05), this shows that there is a significant relationship between hereditary factors and the incidence of hypertension. From the

analysis above, the value of OR = 3.08 is obtained, which indicates that the respondent's hereditary factors are 3.08 times at risk of experiencing hypertension (Nanang et al., 2019)

Based on the results of the ChiSquare test analysis, significant results were obtained with a value of p (0.002) ≤ p α (0.05), which means that there is a significant relationship between hereditary factors or a history of heredity and hypertension and the risk of hypertension in the elderly in the Pandak II Bantul Health Center Work Area. DIY in 2019 (Khotimah et al., 2021)

Relationship between hereditary factors and the incidence of hypertension. Based on the results of the Chi-square test, p = 0.000, which means there is a relationship between hereditary factors and the incidence of hypertension (Situmorang, 2015)

Hereditary history is an inherited factor that triggers hypertension, especially primary hypertension. If someone in the family has hypertension, there is a 25% chance that person will develop hypertension. If both parents have hypertension, the chance of suffering from hypertension increases to 60%. The research results prove that hereditary factors play an important role and determine how likely people are to suffer from hypertension. If you know you have hypertensive parents, you should regularly check your blood pressure and avoid a lifestyle that can increase blood pressure. According to researchers' assumptions, 30 people (71%) have a greater family history of hypertension than people who do not have family members who suffer from hypertension. This was supported when researchers conducted interviews with elderly people regarding the family history of hypertension. The results of the questionnaire questions stated that 71% of all respondents had a family history of hypertension, but healthy lifestyle changes can reduce the incidence of hypertension in the family. Based on the research results, it can be concluded that family history is related to the incidence of hypertension in the elderly in Teupin Kuyuen Village, Seunuddon District, North Aceh Regency.

C. Relationship between salt consumption and hypertension in the elderly

Based on the results of statistical tests using the test *Chi Square* shows that there is a significant relationship between heredity and the incidence of hypertension as proven by the results *p-value =* 0.001. The results of this study show that there is a relationship between salt consumption and the incidence of hypertension because excessive salt intake resulted in hypertension in 34 people (81%) because at the time of the interview the average salt intake was obtained from seafood, table salt, seasonings, soy sauce, ready-to-eat food. and salted fish.

According to (Triandini, 2022) Research conducted on 89 respondents in the work area of the Twenty Three Ilir Health Center, Palembang City. The incidence of hypertension is divided into three categories, namely mild, moderate and severe hypertension. The results of the bivariate analysis showed that of the 46 respondents who consumed high salt and suffered from mild hypertension, there were 11 respondents (12.4%), moderate hypertension, there were 28 respondents (31.5%) and those with severe hypertension were 7 respondents (7.9%) . Test results *Chi-Square* value obtained *p.value* 0.007< α = 0.05 in the work area of the Twenty Three Ilir Health Center, Palembang City. So the hypothesis which states that there is a relationship between high salt consumption and the incidence of hypertension is statistically proven.

Increased sodium intake causes the body to retain fluid, which increases blood volume. The heart has to pump hard to push the increasing volume of blood through an increasingly narrow space, the result of which is hypertension (Muliyati et al., 2011)

CONCLUSION

Based on the results of research and analysis of factors related to hypertension in elderly people in Teupin Kuyun Village, Seunuddon District, North Aceh Regency, the following conclusions can be drawn:

1. Distribution of Blood Pressure in the Elderly is in Hypertension as many as 37 people (88%)
2. The distribution of elderly people is in the Old Age category as many as 40 people (95%)
3. Distribution of the Ancestry History of the Elderly is in the category of There are Descendants as many as 30 people (71%)
4. The distribution of salt consumption is in the category of more than 35 people (83%)
5. There is no significant relationship between age and the incidence of hypertension (*p value = 0,088*) among the elderly in Teupin Kuyun Village, Seunuddon District
6. There is a significant relationship between heredity and the incidence of hypertension (*p value = 0,001*) among the elderly in Teupin Kuyun Village, Seunuddon District
7. There is a significant relationship between salt consumption and the incidence of hypertension (*p value = 0,001*) among the elderly in Teupin Kuyun Village, Seunuddon District

REFERENCES

Azhari, M. H. (2017). Factors Associated with the Incident of Hypertension at the Makrayu Community Health Center, Ilir Barat II District, Palembang. *Aisyah Journal: Journal of Health Sciences*, *2*(1), 23–30. https://doi.org/10.30604/jika.v2i1.29

Aziz Alimul Hidayat. (2014). *Midwifery Research Methods and Data Analysis Techniques*. Salemba Medika.

Khotimah, A., Purnomo, P. S., & Amry, R. Y. (2021). The Influence of Heredity, Obesity and Lifestyle that Influence the Risk of Hypertension in the Elderly in the Pandak II Community Health Center Working Area, Bantul DIY, 2019. *PUBLIC HEALTH SCIENTIFIC JOURNAL: Public Health Community Communication Media*, *13*(1), 34–40. https://doi.org/10.52022/jikm.v13i1.106

Kurniadi, H., & Nurrahmani, U. (2014). *Factors That Influence the Incident of Hypertension in the Elderly in Manisrejo Subdistrict, Madiun City*.

Ledoh, K., S. Tira, D., Landi, S., & Purnawan, S. (2024). Factors Associated with the Incident of Hypertension in the Elderly (60-74 years). *Health Journal*, *13*(1), 27–36. https://doi.org/10.37048/kesehatan.v13i1.301

Muliyati, H., Sirajuddin, S., & Syam, A. (2011). The relationship between sodium and potassium consumption patterns and physical activity with the incidence of hypertension in outpatients at RSUP dr. Wahidin Sudirohusodo Makassar. *Indonesian Community Nutrition Media*, *1*(1).

Muslimah, K., Tharida, M., & Dezreza, N. (2023). Factors Associated with the Incident of Hypertension in the Elderly in Kuta Alam District. *Journal of Healthcare Technology and Medicine*, *9*(1), 447. https://doi.org/10.33143/jhtm.v9i1.2837

Nanang, Triswanti, N., & Kriswiastiny, R. (2019). RESEARCH ARTICLE Relationship between Smoking and Hereditary History with Hypertension Relationship between Smoking and Hereditary History with Hypertension Info article History article. *June*, *11*(1), 30–36. https://doi.org/10.35816/jiskh.v10i2.214

Oktaviana, P., Yanuarini, T. A., & Asiyah, S. (2022). Factors Associated with the Occurrence of Anemia in Pregnancy: Literature Review. *Al-Insyirah Midwifery: Journal of Midwifery Sciences*, *11*(1), 1–12. https://doi.org/10.35328/kebidanan.v11i1.2100

Putri, N. tri, R, R., Febrianti, N., & S, S. (2022). Factors Associated with the Incident of Hypertension in Pregnant Women. *An Idea Nursing Journal*, *1*(01), 43–50. https://doi.org/10.53690/inj.v1i01.114

Rizkiyanti, D., & Trisnawati, Y. (2021). Factors Associated with Hypertension in the Elderly. *Bina Cipta Husada Journal*, *XVII*(1), 151–160.

Situmorang, P. R. (2015). Factors Associated with the Incident of Hypertension in Inpatients at the Sari Mutiara General Hospital in Medan in 2014. *IMELDA Nursing Scientific Journal*, *1*(1), 71–74. http://jurnal.uimedan.ac.id/index.php/JURNALKEPERAWATAN

Triandini, R. (2022). Factors Associated with the Incident of Hypertension at the Twenty Three Ilir Community Health Center, Palembang City in 2021. *Batanghari University Jambi Scientific Journal*, *22*(1), 308. https://doi.org/10.33087/jiubj.v22i1.1805

Zaim Ansari. (2020). Complications of Hypertension in Relation to Patient Knowledge of Hypertension and Efforts to Prevent It. *Journal of Medical Nursing Research*, *2*(2), 2. http://ejournal.delihusada.ac.id/index.php/JPKM/article/view/289/149

STUNTING PREVENTION THROUGH THE PROVISION OF SUPPLEMENTARY FOOD BASED ON LOCAL KNOWLEDGE

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ABSTRACT

Stunting, or impaired growth due to chronic malnutrition during the first 1,000 days of life, remains one of the major public health challenges in Indonesia. Its impacts include delays in physical and cognitive development as well as an increased risk of future diseases. Addressing stunting requires a holistic approach involving nutrition, culture, and community participation.

This study aims to analyze the effectiveness of stunting prevention efforts through the provision of supplementary food based on local knowledge in Blang Geulumpang's Community Health Centre area. Using a qualitative descriptive method with a case study approach, data were collected via in-depth interviews, participatory observations, and document studies involving mothers of toddlers and healthcare workers. Over a 60-day period (May to July), the program demonstrated positive outcomes, with an average weight gain of 1.8 kg and height increase of 3 cm among 12 children.

These results indicate that locally sourced and nutrient-rich food interventions improve nutritional status and can be adapted in other regions. These findings underscore the potential for local food-based supplementary feeding programs to significantly improve child nutrition and prevent stunting. To maximize impact, scaling these culturally relevant interventions across diverse regions is imperative. Policymakers, healthcare practitioners, and community leaders must collaborate to integrate such programs into national strategies, ensuring sustainable and equitable implementation that addresses the broader determinants of child health and nutrition.

Keywords: stunting, supplementary food, nutrition.

INTRODUCTION

Stunting remains one of the most pressing global health challenges, particularly in low- and middle-income countries, where its impact extends beyond the immediate health of affected individuals to broader societal and developmental consequences. Defined by the World Health Organization (WHO) as low height for age, stunting is a clear indicator of chronic malnutrition, which compromises not only physical development but also cognitive function, ultimately limiting a child's potential and contributing to long-term economic and social disadvantages (UNICEF, 2020; WHO, 2021). This phenomenon is deeply entwined with poverty, poor maternal health, inadequate nutrition, and insufficient healthcare services, factors that contribute to the cycle of malnutrition and underdevelopment (Victora et al., 2008).

One of the key global frameworks addressing stunting is the United Nations' Sustainable Development Goals (SDGs), specifically Goal 2, which aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture by 2030. Within this framework, stunting prevention plays a critical role, as it is essential to eradicating malnutrition in all its forms. The global target set under the SDGs is to reduce stunting by 40% by 2025, with a broader goal of ensuring that no child suffers from the consequences of stunting (United Nations, 2015). Despite significant progress, the challenge remains formidable, especially in regions such as Southeast Asia, where stunting rates are alarmingly high (UNICEF, 2020).

According to the latest data from UNICEF, WHO, and the World Bank Group, the global number of children under five suffering from stunting in 2019 was estimated at approximately 149 million, with a slight decrease to 21.8 million in 2020. This data reveals a slight improvement but underscores the urgent need for more effective interventions. In Southeast Asia, the number of stunted children dropped from 38.5 million in 2019 to 24.7 million in 2020, showing that progress is being made (UNICEF, 2021; World Bank, 2020). However, the rates remain unacceptably high, particularly in countries like Indonesia, which, with a stunting prevalence rate of 31.8%, ranks second in Southeast Asia, only behind Timor Leste, which has a stunting prevalence of 48% (SSGI, 2022).

In Indonesia, despite a notable decrease in the stunting prevalence rate from 24.4% in 2021 to 21.6% in 2022, the country still falls short of its national target of reducing stunting to 14% by 2024 (SSGI, 2022). This data suggests that while governmental efforts, including various nutrition-focused interventions and public health campaigns, have yielded positive results, more comprehensive and contextually appropriate solutions are required to achieve the 2024 target and beyond. The government of Indonesia has implemented several strategies, such as maternal and child health interventions, nutrition education, and food supplementation programs, to combat stunting, but the

effectiveness of these strategies must be continuously evaluated and refined (Kementerian Kesehatan RI, 2020).

Addressing the root causes of stunting requires multifaceted approaches that focus not only on improving food availability but also on changing social, economic, and health-related behaviors (Black et al., 2013). Traditional knowledge and local practices offer an invaluable resource in these efforts. The use of locally sourced foods in the provision of supplementary nutrition has gained attention as a sustainable and culturally relevant method to combat stunting. Local knowledge about nutritious food sources, preparation methods, and dietary habits can enhance the effectiveness of supplementary feeding programs, making them more accessible and acceptable to communities (Suhartini et al., 2019).

This article explores the role of supplementary food provision, specifically based on local knowledge, in the prevention of stunting. Through the integration of culturally relevant, nutritious food options into national and community-based nutrition programs, it is possible to address the issue of stunting while also promoting sustainability and community empowerment (Reinbott et al., 2018). The subsequent sections will discuss various initiatives and case studies that have successfully utilized local knowledge in nutrition interventions, highlighting their impact on reducing stunting in various regions, particularly in Southeast Asia. Additionally, the article will delve into the importance of collaboration between governments, local communities, and international organizations in ensuring the sustainability and scalability of stunting prevention programs (Barrera et al., 2019).

Given the complexity of stunting, which involves multiple factors such as poor maternal health, inadequate early childhood care, lack of access to health services, and poor feeding practices, this article will also address the need for comprehensive strategies that go beyond food supplementation. The broader determinants of health, such as education, sanitation, and access to healthcare, must be considered in any attempt to reduce stunting rates (World Health Organization, 2014). A multi-sectoral approach, which includes improvements in education, health, and economic opportunities, is crucial for breaking the cycle of malnutrition and promoting long-term development (UNICEF, 2019).

In conclusion, while stunting is a daunting challenge, it is not insurmountable. The integration of supplementary food programs based on local knowledge provides a promising avenue for stunting prevention, especially when coupled with broader efforts aimed at improving overall health and nutrition. By leveraging local expertise and combining it with evidence-based strategies, it is possible to make significant progress toward achieving the SDG targets and ensuring a healthier future for the next generation. The fight against stunting requires not only global and national commitment but also a deep understanding of local contexts and the active involvement of

communities in crafting solutions that are both effective and sustainable (Prentice & Schoenmakers, 2020)

METHODS

This qualitative study employed a descriptive approach to explore the provision of supplementary food based on local knowledge. Data were collected using triangulation methods: (1) In-depth Interviews; Conducted with mothers of toddlers and healthcare workers to gather insights into local food practices, community perceptions, and challenges, (2) Participatory Observations; Observing the preparation, distribution, and acceptance of local food-based supplementary feeding, (3) Document Analysis; Reviewing records from the health center, including nutritional data and program implementation details.

This method aligns with Creswell's (2014) view that qualitative research aims to describe phenomena holistically, considering the context and perceptions of the research subjects in their natural settings. This approach also corresponds with Yin's (2018) emphasis on the importance of case studies in social research, as they provide a deep understanding of the dynamics within specific phenomena.

RESULTS AND DISCUSSION

The total population in the Blang Geulumpang Community Health Center area, based on the latest data from 2024, is 719 toddlers, with the number of toddlers as follows 355 male toddlers, and 364 female toddlers.

The cultural traditions of the Blang Geulumpang community uphold a strong social structure, with the practice of cooperation (gotong royong) still highly valued. The community helps each other in various activities, including rituals such as kenduri, which are held to celebrate events like births, circumcisions, or thanksgiving ceremonies. These activities utilize local, nutrient-rich food ingredients, such as rice, fish, vegetables, and spices. This reflects the local local expertise in utilizing natural resources.

Most parents interviewed had basic knowledge of stunting as a condition involving poor child growth (e.g., short stature, low weight). However, they lacked deeper understanding of its causes (e.g., nutritional deficiencies during pregnancy, improper feeding practices) and long-term effects (e.g., cognitive and health issues). While some parents recognized local foods as potentially beneficial for improving their child's health, they often did not fully comprehend how these foods could specifically prevent stunting or how to prepare them to maximize nutritional value.

This study found that providing supplementary feeding based on local knowledge positively impacts stunting prevention. The Blang Geulumpang Health Center utilized locally available food, such as milkfish, shrimp, and local vegetables, which are nutritious and easily accessible to the community. The research revealed the following key points:

**Effectiveness of Local Supplementary Feeding in Stunting Prevention**
Supplementary feeding over 60 days resulted in weight and height increases in stunted toddlers. For instance, the children gained an average of 1.5–2 kg in weight and 1–2 cm in height after the program. Using local ingredients like tilapia and shrimp provided high animal protein while reducing dependence on imported foods. A study by Munawarah et al. (2023) found that using local ingredients such as fish and legumes significantly improved the nutritional status of toddlers. A similar program in Sulawesi reported an average weight gain of 1.8 kg after eight weeks of local supplementary feeding.

Table 1 Weight and Height Changes

Child ID	Gender	Before		After		Nutritional Status
		Weight	Height	Weight	Height	
Child 1	M	9.4 kg	84 cm	10.1	85 cm	stunted
Child 2	M	8.1 kg	77 cm	9 kg	79.2 cm	severely stunted
Child 3	M	6 kg	68 cm	7.6 kg	69 cm	severely stunted
Child 4	M	7 kg	75 cm	8 kg	76 cm	stunted
Child 5	F	6 kg	68 cm	7.6 kg	69 cm	severely stunted
Child 6	M	6.2 kg	65 cm	8 kg	70 cm	severely stunted
Child 7	M	6.2 kg	65 cm	8 kg	70 cm	severely stunted
Child 8	M	8 kg	73 cm	8 kg	70 cm	severely stunted
Child 9	F	5.8 kg	64.5 cm	6.7 kg	67 cm	stunted
Child 10	F	9 kg	89.1 cm	9.5 kg	89.3 cm	severely stunted
Child 11	F	7.9 kg	75 cm	8.2 kg	78 cm	stunted
Child 12	M	9.7 kg	80.5 cm	9.9 kg	82 cm	stunted

Source: Profile of Blang Geulumpang Community Health Center
Based on the table 1, over 60 days, children experienced an average weight gain of 1.8 kg and a height increase of 3 cm. This aligns with findings from similar studies in Southeast Asia, emphasizing the effectiveness of locally sourced food.
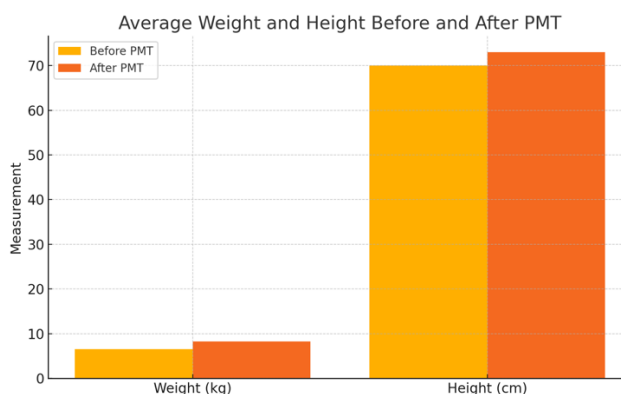
The bar chart illustrates the positive impact of the 60-day supplementary feeding program (PMT) on the nutritional status of children. The average weight increased from 6.5 kg to 8.3 kg, showing an average gain of 1.8 kg, while the average height rose from 70 cm to 73 cm, reflecting an average growth of 3 cm.

All children experienced an increase in both weight and height after receiving PMT, though the degree of improvement varied. Despite these physical changes, most children remained in the stunted or severely stunted categories, indicating that the intervention had limited impact on addressing chronic nutritional issues. None of the children transitioned to a normal nutritional status during the program.

This suggests that while PMT contributes to weight and height gains, additional measures may be required to effectively address stunting. These measures could include educating parents about proper nutrition, promoting healthier diets, and providing more comprehensive health monitoring. Furthermore, the program's effectiveness needs to be evaluated, as the 60-day duration might not be sufficient to produce significant improvements in the children's nutritional status.

Education and Raising Community Awareness

The program successfully increased community awareness of the importance of nutritious food. Education was delivered through direct sessions at health posts (Posyandu), brochures, and cooking training to maintain food nutrient value. However, knowledge levels varied, especially among those with lower education levels.

According to Pratiwi et al. (2022), nutrition education for mothers of toddlers is a critical component of the success of supplementary feeding programs. Education on preparing local food can increase nutrient absorption by up to 25%. This research emphasized the need for easy-to-understand information delivery, especially in rural communities.

Utilizing local food reflects cultural integration and sustainability. Besides improving nutritional status, the program preserved cultural values by using traditional recipes. This approach helped the community understand the importance of nutrition without drastically changing their eating habits.

Some of the challenges include; limited community knowledge about proper food preparation, logistical difficulties, such as distributing food to remote areas, ensuring a consistent supply of food ingredients.

Romadhona et al. (2021) showed that involving communities and local leaders in child health programs enhances their effectiveness. Integrating local cultural values makes supplementary feeding programs more acceptable to the community. A study by Sugianto et al. (2021) noted that food accessibility is a major challenge in remote areas. A proposed solution is developing local networks to ensure the availability of food ingredients, as implemented in Blang Geulumpang.

CONCLUSION

This study highlights the critical role of local wisdom-based supplementary feeding in addressing stunting, a pressing public health issue in Indonesia. By leveraging locally sourced and nutrient-rich foods, the program implemented in the Blang Geulumpang Health Center not only improved the nutritional status of stunted children but also fostered cultural preservation and community engagement. The findings emphasize the value of integrating local food resources into public health initiatives, making interventions more sustainable and contextually appropriate.

Beyond its immediate impact on weight and height gains among toddlers, the program demonstrated that community-driven solutions could bridge gaps in food security and

access to nutrition. Education and active involvement of parents were key drivers of success, underscoring the importance of empowering families with knowledge and practical skills for long-term dietary improvements. However, challenges such as inconsistent food availability and limited understanding of food preparation highlight areas where further efforts are needed.

Future research should explore scalable models for replicating this approach in diverse settings, focusing on optimizing logistics, enhancing educational outreach, and incorporating technological tools to strengthen community participation. By building on the insights from this study, stakeholders can create comprehensive and sustainable strategies to reduce stunting and improve child health outcomes globally.

ACKNOWLEDGEMENT

REFERENCES

Barrera, A., et al. (2019). "Community-Based Nutrition Programs: A Review of Effectiveness." *Public Health Nutrition*, 22(1), 21-29.

Black, R. E., et al. (2013). "Maternal and Child Undernutrition and Overweight in Low-Income Countries." *The Lancet*, 382(9890), 427-451.

Kementerian Kesehatan Republik Indonesia. (2020). "Laporan Nasional Status Gizi Indonesia 2020." Kementerian Kesehatan RI.

Munawarah, A., et al. (2023). *The Role of Local Food-Based Supplementary Feeding in Reducing Stunting in Indonesia*. Journal of Nutritional Science, 12(3), 45-58.

Pratiwi, R., et al. (2022). *Nutrition Education and Its Impact on the Success of Supplementary Feeding Programs*. Indonesian Journal of Health Promotion, 10(1), 34-50.

Prentice, A. M., & Schoenmakers, I. (2020). "A Global Perspective on Malnutrition: Addressing Stunting through Localized Interventions." *Nutrition Reviews*, 78(7), 527-539.

Reinbott, A., et al. (2018). "Nutrition-Sensitive Approaches in Stunting Prevention: Integrating Local Knowledge." *Journal of Nutritional Science*, 7(4), 129-142.

Romadhona, D., et al. (2021). *Community Engagement in Stunting Prevention Programs: A Cultural Perspective*. International Health Review, 8(4), 60-75.

SSGI (Sustainable Social Growth Indicator). (2022). "Prevalence of Stunting in Indonesia: A Decade of Progress and Challenges." *Indonesia Social and Health Report*, 16(2), 67-80.

Suhartini, S., et al. (2019). "Leveraging Local Knowledge for Nutrition-Sensitive Interventions: Addressing Malnutrition in Indonesia." *Journal of Local Food Systems*, 18(1), 45-60.

Sugianto, M., et al. (2021). *Challenges and Opportunities in Addressing Stunting in Rural Areas*. Journal of Public Health Policy, 9(2), 70-85.

United Nations. (2015). "Transforming Our World: The 2030 Agenda for Sustainable Development." United Nations.

UNICEF. (2019). "The State of the World's Children 2019: Children, Food, and Nutrition." UNICEF.

UNICEF. (2020). "Global Data on Stunting." *UNICEF Data*, accessed August 2020.

WHO. (2021). "Nutrition for Health and Development: Stunting Prevention." World Health Organization.

World Bank. (2020). "Child Stunting: A Global Challenge." *World Bank Group*

APPENDIX
(if any)

Effectiveness Of Using Virgin Coconut Oil Against Diaper Rash In Babies In PMB Syafriani, Nibong District North Aceh District

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ABSTRACT

The World Health Organization (WHO) released data about babies who experience diaper rash. This results in as many as 250,000 out of 1,000,000 babies undergoing outpatient care who experience very severe diaper rash. This incident is most often found in babies aged around 1 year. The research aimed to analyze the effectiveness of virgin coconut oil (VCO) on diaper rash in babies at PMB Syafriani. The research method used a plan and strategy to carry out the research, which was included to answer the problems faced. The design of this research used a Quasi-experimental post-test only with a control group with a purposive sampling technique totaling 30 babies. The research results obtained were that the majority of respondents before being given the intervention had a mild/moderate diaper rash category of 14 respondents (46.7%) The majority of respondents after being given the intervention had a mild diaper rash category of 16 respondents (53.3%) Inuence The effectiveness of using Virgin Coconut oil against diaper rash in babies in PMB Syafriani, Nibong sub-district, North Aceh Regency with a sig value of 0.000 (p = value)

Keywords: virgin coconut oil, diaper rash, baby

INTRODUCTION

The World Health Organization (WHO) released data about babies who experience diaper rash. This results in as many as 250,000 out of 1,000,000 babies undergoing outpatient care when experiencing very severe diaper rash. This incident is most often found in babies aged around 1 year. According to data released by the World Health Organization,the prevalence of skin irritation (diaper rash) in babies is quite high, namely 25% of babies born worldwide, most of whom suffer from skin irritation (diaper rash) due to the use of diapers. The highest numbers are found at the age of 6-12 months (WHO, 2018).

According to Apriza (2017), in Indonesia, 7-35% of male and female babies experience diaper rash. Most occur in babies aged 0-12 months. The cause of diaper rash in babies is generally because parents do not give the baby time to remove the diaper for at least 2-3 hours,the baby is free from wearing diapers, the condition of the diaper is full of urine,the size of the diaper does not suit the child's needs. As a result of frequent use of diapers,the baby's skin becomes infected due to fungi or germs in the feces or urine.

Based on the results of previous research,from Setianingsih & Hasanah (2017),the results showed that there was a decrease in the degree of diaper rash in babies aged 0-12 months after giving olive oil for 5 days in the morning and evening around 2.5 ml of olive oil (olive oil) with a sample of 36 babies with grade 1 diaper rash who experienced recovery, 25 babies (69.9%) and 11 babies (21.6%) experienced improvement in grade 2 diaper rash. The second research conducted by Jennifa, Atik, & Purwaningsih (2014) showed results from applying VCO (Virgin Coconut Oil) for 21 days to a sample of 14 babies with mild diaper rash, 12 babies (85.7%) experienced recovery and 2 babies (14.3%) who still experienced grade 2 diaper rash. Then the third was carried out by Nurlaetul, Hartini & Astuti (2016) by applying for 5 days using nigella sativa oil (black cumin oil) from a sample of 18 babies with grade 2 diaper rash,the results showed that 17 babies had grade 1 diaper rash and 1 baby still had grade 2. The fourth research was conducted by Iimran (2017) by applying baby oil, using a sample of 10 babies with grade 1 diaper rash, it was found that 7 babies (70%) experienced recovery and 3 babies (30%) experienced an increase in grade 2 diaper rash. Coverage for babies experiencing skin irritation (diaper rash) is 35 babies. Based on this,research needs to be carried out on the effectiveness of using virgin coconut oil against diaper rash in babies in Pmb Syafriani District. Nibong District. North Aceh to create an internal policy appropriately and in accordance with established procedures.

METHODS

The design of this research used a Quasi-experimental post-test only with the control group. The design uses a treatment group that is given intervention in the form of standard preventive care with VCO every time the baby's diaper is changed (every 3 hours) in areas of skin that are in close contact with the diaper. The sample for this study was a baby who experienced diaper rash at PMB Syafriani, Nibong Baroh Village, District. Nibong District. North Aceh. The sampling technique was purposive sampling,totaling 30 babies with diaper rash. Data collection was carried out by interviews and observations.

Bivariate analysis was used to determine whether there was a decrease in the degree of diaper rash before and after being given virgin coconut oil, namely by carrying out the T-test, namely the dependent T-test if the data was normally distributed and using the Wilcoxon test if the data was not normally distributed.

RESULTS AND DISCUSSION

Based on research conducted by researchers in March – May 2024,there were 30 respondents with a research entitled "Effectiveness Of Using Virgin Coconut Oil Against Diaper Rash In Babies In PMB Syafriani, Nibong District North Aceh District". Then the results of the characteristics of respondents can be obtained as follows.

Table 2.
Frequency Distribution of Characteristics in PMB Syafriani, Nibong District, North Aceh Regency

No	Characteristic	N	%
1	20-35 years	28	93,3
	>35 years	2	6,7
	Amount	**30**	**100.0**
No	**Education**	**N**	**%**
2	SMP	6	20
	SMA	17	56,7
	D III/S1	7	23,3
	Amount	**30**	**100.0**
No	**Type Of Work**	**N**	**%**
3	Work	9	30
	Doesn't Work	21	70
	Amount	**30**	**100.0**
No	**Income**	**N**	**%**
4	Upper UMP	15	50
	Under UMP	15	50
	Amount	**30**	**100.0**
No	**Number of Child**	**N**	**%**
5	1 Child	11	36,7

No		N	%
	2-4 Child	19	63,3
	Amount	**30**	**100.0**
No	**Age Of Child**	**N**	**%**
5	1-6 months old	20	66,7
	7-11 months old	10	33,3
	Amount	**30**	**100.0**
No	**Weight at Birth**	**N**	**%**
6	<2500 gram	1	3,3
	2500-4000 gram	29	96,7
	Amount	**30**	**100.0**

Source: Primary Data (Processed in 2024)

Based on Table 1, it can be seen that the majority of respondents aged 20-35 years were 28 people (93.3%), had a high school education as many as 17 people (56.7%), were not working as many as 21 people (70%), had income above the minimum wage (UMR). 15 people (50%),the number of children was 2-4 people (63.3%),the number of children aged 0-6 months was 20 people (66.7%) and the birth weight was 2500-4000 grams. 29 people (96.7%).

Table 2.
Frequency Distribution of Respondents Based on Diaper Rash in PMB Syafriani, Nibong District, North Aceh Regency

No	Diaper Rush	Before		After	
		f	%	f	%
1	Very light	0	0	8	26,7
2	Light	5	16,6	16	53,3
3	Light-medium	14	46,7	6	20
4	Currently	11	36,7	0	0
	Amount	30	100	30	100

Source: Primary Data (Processed in 2024)

Based on Table 2, it can be seen that before being given virgin coconut oil,the majority experienced mild/moderate diaper rash, 14 people (46.7%), whereas after being given virgin coconut oil,the majority experienced mild diaper rash, 16 people (53.3%)

Table 3. Data Normality Test

Groups	Shapiro-Wilk		
	Statistik	**Df**	**ρ value**
Diaper rush pretest	0,798	30	0,000
Diaper rush posttest	0,804	30	0,000

Source: Primary Data (Processed in 2024)

Based on Table 3, it can be seen that the results of the normality test are not normally distributed ($\rho < 0.05$), namely diaper rash before administering virgin

coconut oil with a ρ value of 0.000 and after administering a virgin coconut oil compress of 0.000, so the statistical test used is the Wilcoxon test.

Table 4.
Average Diaper Rash Before and After Giving Virgin Coconut Oil in PMB Syafriani Nibong District North Aceh Regency

Virgin Coconut Oil	Diaper Rush		
	Mean Pretest	**Mean Posttest**	**Diference**
Pretest-posttest	1,60	0,97	0,63

Source: Primary Data (Processed in 2024)

Based on Table 4, it can be seen that before being given virgin coconut oil the average number of respondents' diaper rash was 1.60, whereas after being given virgin coconut oil the average level of diaper rash was 0.97 with a decrease of 0.63, meaning there is a difference in the average degree of diaper rash before and after administering virgin coconut oil.

Table 5.
Posttest diaper rash- Pretest diaper rash with the Wilcoxon test at PMB Syafriani Nibong District North Aceh Regency

Virgin Coconut Oil	Ruam Popok			
	Negatif Ranks	**Positif Ranks**	**Ties**	**ρ *value***
Pretest-posttes	30	0	0	0,000

Source: Primary Data (Processed in 2024)

Based on Table 5, it can be seen that after being given virgin coconut oil, 30 respondents experienced a decrease in the degree of diaper rash (negative value ranks 30), and there were 0 respondents who experienced an increase in the degree of diaper rash after being given virgin coconut oil (positive value ranks 0) and none There were respondents whose degree of diaper rash persisted after being given virgin coconut oil (tie value 0) with a ρ value of 0.000, meaning that providing virgin coconut oil was effective in treating diaper rash in babies.

DISCUSSION

Coconut Oil Effectiveness Results

Based on the results of the Wilcoxon test to determine the effectiveness of the research, it was found that the average diaper rash before and after the intervention was given, the results of the normality test were not normally distributed (ρ<0.05), namely diaper rash before giving virgin coconut oil with a ρ value of 0.000 and after giving virgin coconut oil 0.000, so the statistical test used is the Wilcoxon test.

The results of this research are in accordance with research conducted by Raras Dwi, et al, (2023) Data analysis using the Wilcoxon test. The results of this study show that there is a difference after giving VCO to babies aged 0-12 months p = 0.000 (<0.0.5) with an average decrease score of 1,175. There is an effect of giving Virgin Coconut Oil (VCO) on diaper rash in babies aged 0-12 months given 2x a day for 5 days. Vco can be an alternative for treating diaper rash in babies. Based on the results of research conducted by Setianingsih and Hasanah (2017), it was found that there was a reduction in the degree of diaper rash in babies aged 0-12 months, after giving olive oil for 5 days in the morning and evening at around 2.5 ml of olive oil.

The results of research by Jennifa et al, (2014), obtained results from applying VCO (virgin coconut oil) for 21 days to a sample of 14 babies with mild diaper rash who experienced recovery from 12 babies (85.7%) and 2 babies (14.3 %) who still have a rash.

CONCLUSION

Based on research entitled The Effectiveness of Using Virgin Coconut Oil on Diaper Rash in Babies in PMB Syafriani, Nibong District, North Aceh Regency, it can be concluded that the Effect of Effectiveness of Using Virgin Coconut Oil on Diaper Rash in Babies in PMB Syafriani, Nibong District, North Aceh Regency with a sig value. 0.000 (p = value <0.05).

REFERENCES

Aditya, N. (2014). Hand book for New mom, CV. Diandra primamitra Media

Apriza, A. (2017), The effect of giving olive oil on diaper rash in babies at Bangkinang Hospital in 2016, Nursing Journal, 1 (2), 10-19, https://doi.org/10.31004/Jn .VII2.113

Aryunani, syuhrotut, fulatul (2022), "Midwifery care for neonates for babies, toddlers & pre-school children." Kedung Kendang : Rena Cipta Mandiri

Bahruddin, A.D. (2019). The relationship between the use of instant diapers and the incidence of diaper rash in babies in posyandu in the Panca Tunggal Village Working Area, South Lampung Regency 2018. Malahayati Midwifery Journal, 5(2), 122-127, Https://Doi.org/1033024/Jkm.V5i2. 1256

Cahyati, D., Indrasari, A., & Kusumaningrum, A. (2015). Effect of Virgin Coconut oil on diaper rash in babies, Sriwijaya Nursing Journal, volume 2 (1), 57-62

Lhokseumawe City Health Office, (2021) "PWS KIA"

Aceh Health Office, (2020) "Aceh Health Profile". [Internet] Available at https://dinkes.acehprov.go.id.uploads/Ikj dinkes 2021.pdf.[accessed] February 2021

Humune, H, (2018). The level of knowledge and attitudes of mothers regarding the incidence of diaper rash in babies at Bps Zulfiah Surabaya. Diapers on babies at Bps zulfiah Surabaya, 1999, 84-89

Indrayani and Djami, (2016), "update on childbirth and newborn care". Jakarta : Trans media info

Meliyana, E., & Himalia, N. (2018), The effect of giving coconut oil on the incidence of diaper rash in babies. Pomegranate imagery: Scientific journal of Bangka Belitung pomegranate imagery stickers, 2(1), 71-80. https:// doi.org/1033862/citradelima.V2il.12 prevention of disturbances in the integrity of perianal skin tissue in infants with diarrhea. Akp Journal, 4 (2), 55-61, Retrieved from https:// ejournal.akperpamenag.ac.id/index.php/akp/article/view/82

Nikmah, A., Sariati, Y., & Hastuti, N. A. R. (2021). Differences in the effectiveness of administering olive oil and virgin coconut oil (VCO) on months in the working area of the Pandawangi Malang Community Health Center. January of in Midwifery, 5(3),121-128, https: Doi.org./10.21 776 /ub .join 2021.005.03.3

Susanti, E (2020). Efforts to cure diaper rash using VCO (virgin coconut oil) Scientific journal, 1-10

Sinta El, Andriani F, yukizawati and insari AA. (2019) "Anjar's book on midwifery care for neonates, babies and toddlers." Griya Kebonagung. Indonesian Library

THE INFLUENCE OF THE ROLE OF POSYANDU CADRES ON THE OPTIMIZATION OF POSYANDU IN PREVENTING STUNTING IN THE MUARA SATU HEALTH CENTER IN LHOKSEUMAWE CITY

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ABSTRACT

Malnutrition conditions over a long period of time have an impact on reducing the quality of life of children in the future and have succeeded in attracting world attention, including Indonesia. In SDG's 2030 Indonesia targets to end hunger as the second goal by reducing the prevalence of stunting in toddlers by 2025. Effective implementation of posyandu in accordance with technical instructions will certainly reduce the incidence of stunting in toddlers, especially optimization in steps IV and V of posyandu, namely providing health education by cadres and health services by health workers. The aim of this research is to determine the influence of the role of posyandu cadres on the optimization of posyandu in preventing stunting in the working area of Muara Satu Health Center, Lhokseumawe City in 2024. This type of research is analytical observational research using a crosssectional approach. The population in this study were posyandu cadres in the working area of the Muara Satu Health Center, Muara Satu District, Lhokseumawe City in 2024. The sample for this study was purposive sampling, namely all posyandu cadres in the Muara Satu Community Health Center working area, Muara Satu District, Lhokseumawe City. The results of the study showed that the oral motor skills of babies aged 6-12 months before the role of active cadres in preventing stunting in the Muara Satu Community Health Center Working Area, Lhokseumawe City were in the active category, namely 71

people (94.7%) and 4 people (5,3%) who were inactive. Optimization of posyandu in preventing stunting in the Muara Satu Community Health Center Working Area, Lhokseumawe City in the Yes category, namely 67 people (89.4%) and 8 people (10.6%) who were inactive. The role of posyandu cadres influences the optimization of posyandu in prevention. stunting in the working area of Muara Satu Health Center, Lhokseumawe City in 2024 p=0.000 <0.05. It is hoped that posyandu cadres will have the motivation and awareness to carry out health efforts, especially regarding stunting prevention so that the incidence of stunting in toddlers can be prevented and the health status of babies and toddlers will improve.

Keywords: *Posyandu Cadres, Stunting, Optimization of Posyandu.*

INTRODUCTION

Stunting is a chronic nutritional problem that has a serious impact on children's growth and development. According to a report by the Indonesian Ministry of Health, the prevalence of stunting in Indonesia is still quite high, with an average of 27.67% in 2021, far above the WHO standard which sets a maximum limit of 20% (Kemenkes RI, 2020; World Health Organization, 2019). This condition shows that stunting is not just a nutritional problem, but a complex challenge that involves various determinant factors such as poverty, maternal education, access to health services, and parenting patterns (Unicef, 2024).

Posyandu has a strategic role in stunting prevention efforts through community-based interventions. As an integrated service post, Posyandu is the main gateway in monitoring the health and nutritional status of children under five at the community level (Adriani & Wirjatmadi, 2018). Posyandu cadres carry out critical tasks in mobilizing active community participation, carrying out key activities such as weighing toddlers, early detection of growth disorders, providing immunizations, and community-based health counseling (Nurlaili, H & Ayu Pertiwi, NF. 2024).

The Muara Satu Health Center Working Area of Lhokseumawe City is interesting to study because it has complex geographic and demographic characteristics. Based on preliminary data, this area still shows significant stunting rates, with prevalence reaching 35% in 2022, exceeding the national average (Dinas Kesehatan Kota Lhokseumawe, 2022). Factors such as community education level, access to health services, and nutrition knowledge are key variables that influence the effectiveness of stunting prevention interventions (Yunawati,dkk, 2023).

Optimizing the role of Posyandu cadres is a strategic key in reducing the prevalence of stunting. Previous research shows that the quality and capacity of

cadres contribute significantly to the success of public health programs (Almatsier, 2019). The competence of cadres in conducting nutritional screening, counseling families, and building coordination networks with health professionals is a determining factor in the success of stunting prevention interventions (Kemenkes RI, 2020).

This study aims to comprehensively analyze the influence of the role of Posyandu cadres on optimizing stunting prevention efforts. Through a systematic approach, this study will identify factors that support and hinder the performance of cadres, measure the effectiveness of interventions, and formulate strategies for developing cadre capacity in reducing the prevalence of stunting in the Muara Satu Puskesmas working area.

METHODS

The research design will use a cross sectional analytical type which aims to determine the relationship between variables where the independent and dependent variables are identified at one unit of time. This research was conducted in the Muara Satu Community Health Center working area, Lhokseumawe City in June 2024. The population in this study was posyandu cadres in the Muara Satu Health Center working area, Muara Satu District, Lhokseumawe City in 2024. The sampling technique used purposive sampling technique for 75 respondents.

RESULTS AND DISCUSSION

Based on the results of the research, it is obtained
1. Univariate Analysis

Tabel 1. Age Frequency Distribution of Respondents

Respondent Characteristics	f	Persentase (%)
Age		
20-35 (y)	46	61,3
36-50 (y)	29	38,7
Education		
Medium	69	92,0
High	6	8,0
Length of time ss a cadre		
1-2 (y)	11	23,0
>2 (y)	64	77,0

Based on table 1 above, it can be seen that the age of the majority of mothers is in the 20-35 category, namely 46 people (61.3%), the education of the majority of cadres is medium, namely 69 people (92.0%), and the majority of years as a posyandu cadre is > 2 years, namely 64 people (77.0%).

Table 2. Frequency Distribution of Cadre Roles in Optimizing Posyandu in Prevention of Stunting in the Muara Satu Community Health Center Working Area Lhokseumawe City Lhokseumawe Year 2024

Cadre Role	f	(%)
Active	71	94,6
Inactive	4	5,3
Total	75	100

The results of the research show that the role of active cadres in preventing stunting in the Muara Satu Health Center Working Area, Lhokseumawe City is in the active category, namely 71 people (94.3%) and 4 people (5.7%) who are inactive.

Table 3. Frequency Distribution of Optimizing Posyandu in Stunting Prevention in Muara Satu Health Center Working Area, Lhokseumawe City, Lhokseumawe in 2024

Optimization of Posyandu	f	(%)
Active	67	89,3
Inactive	8	10,7
Total	75	100

The results of the research showed that the optimization of posyandu in preventing stunting in the Muara Satu Community Health Center Working Area, Lhokseumawe City was in the Yes category, namely 67 people (89.3%) and no, namely 8 (10.7%).

2. Bivariate Analysis

Tabe 4. Analysis of the Influence of the Role of Posyandu Cadres on Optimizing Posyandu in Preventing Stunting in the Working Area of Muara Satu Health Center, Lhokseumawe City in 2024.

Cadre Role	Optimization of Posyandu				Total		P Value	OR
	Inactive		Active					
	n	%	n	%	n	%		
Active	4	5,3%	67	89,4%	71	94,7%	0,000	0,0
Inactive	4	5,3%	0	0%	4	5,3%		56
Total	8	10,6%	67	89,4%	75	100%		

Based on the table above, it is known that the results of the chi square statistical test obtained p = 0.000 <0.05, meaning that the role of posyandu cadres affects the optimization of posyandu in preventing stunting in the working area of the muara one health center in lhokseumawe city in 2024.

The results of the chi-square statistical test with a value of p=0.000 (<0.05) indicate a significant relationship between the role of posyandu cadres and the optimization of posyandu functions in stunting prevention. Posyandu cadres act as the frontline in health services in the community, especially in vulnerable groups such as pregnant women and toddlers.

In the Muara Satu Puskesmas working area, cadres who are actively involved in education, monitoring toddler growth, and distributing nutritional supplements are able to increase the level of visits to posyandu. This supports the effective implementation of stunting prevention programs, such as supplementary feeding (PMT) and vitamin A supplementation.

The results of this study are in line with research conducted by Anisa Rahmawati et al. (2022) in the posyandu area of Bojong village, Klapanunggal sub-district found that trained posyandu cadres had a significant impact on increasing mothers' knowledge about toddler nutrition. The cadres were able to provide education related to the importance of exclusive breastfeeding, proper complementary feeding, and monitoring children's weight and height. This increased family awareness about the risk of stunting and how to prevent it. Similarly, research conducted by Nugraheni, N and Malik, A (2023) in Ngijo Village, Semarang City showed that there are several roles of posyandu cadres related to preventing stunting cases in Ngijo Village. There are four roles of posyandu cadres in preventing stunting cases, namely: 1) health servant, 2) health educator, 3) community mobilizer and empowerer, and 4) health monitor. In carrying out their duties and roles, posyandu cadres are accompanied by field officers or health workers from Puskesmas Sekaran. Posyandu cadres are expected to spearhead the prevention of stunting cases. Posyandu cadres are people who are considered close to the community, so they are expected to be able to convey information related to stunting. In addition, there are also several obstacles in the implementation of stunting prevention, including the lack of motivation of cadres, lack of facilities and infrastructure, and funding.

Another study conducted by Alya Yasmine, H et al. (2024) found that cadres who were highly motivated and supported by regular training were able to perform their duties better, including in recording toddlers at risk of stunting and providing referrals to the puskesmas. These findings show a similar pattern:

active and trained posyandu cadres have a positive impact on the success of public health programs, especially in stunting prevention.

We assume that the effectiveness of the role of posyandu cadres in stunting prevention is influenced by continuous training where cadres who are given regular training tend to be better able to provide education to the community about balanced nutrition, healthy eating patterns, and the importance of exclusive breastfeeding. Supervision and Support from Puskesmas where guidance from health professionals improves cadres' competence in carrying out their duties, including monitoring child growth and identifying nutrition problems. And Community Involvement where support from the community and family is essential to strengthen the functioning of posyandu. Increased posyandu visits indicate community trust in the health service.

In addition, researchers also noted that socio-economic factors and mothers' education levels also influenced the success of the program. For example, mothers with better nutrition knowledge are more likely to make optimal use of posyandu services.

CONCLUSION

Based on the results of research conducted in meuria paloh village, muara one sub-district, lhokseumawe city can be concluded:
a. The role of cadres who are active in preventing stunting in the Muara Satu Health Center Working Area of Lhokseumawe City in the active category is 71 people (94.3%) and 4 people (5.7%) who are not active.
b. Optimization of posyandu in preventing stunting in the Muara Satu Puskesmas Working Area of Lhokseumawe City in the Yes category, namely 67 people (89.3%) and those who are not, namely 8 (10.7%).
c. The role of posyandu cadres affects the optimization of posyandu in preventing stunting in the working area of the muara one health center, Lhokseumawe city in 2024 p=0.000 <0.05.

ACKNOWLEDGEMENT

REFERENCES

Adriani, M., & Wirjatmadi, B. (2018). Gizi dan Kesehatan Balita. Kencana.

Almatsier, S. (2019). Prinsip Dasar Ilmu Gizi. Gramedia Pustaka Utama.

Alya Yasmine, H, dkk. (2024). Peran Kader Posyandu dalam Upaya Pencegahan Stunting. *Journal of Telenursing*, 6(1).

Annisa Rahmati, S, dkk. (2022). Hubungan Pengetahuan Ibu, Status Gizi Balita dan Peran Kader Posyandu Terhadap Perilaku KADARZI di Posyandu Wilayah Desa Bojong. Sentri: Jurnal Riset Ilmiah, 3(8).

Dinas Kesehatan Kota Lhokseumawe. (2022). Laporan Tahunan Status Gizi Balita.

Kementerian Kesehatan RI. (2020). Pedoman Pelaksanaan Posyandu. Kemenkes RI.

Kementerian Kesehatan RI. (2021). *Panduan Pelaksanaan Posyandu untuk Pencegahan Stunting*. Jakarta: Kementerian Kesehatan RI.

Nugraheni, N & Malik, A. (2023). Peran Kader Posyandu dalam Mencegah Kasus Stunting di Kelurahan Ngijo Kota Semarang. *Lifelong Education Journal*, 3 (1).

Nurlaili, H & Ayu Pertiwi, NF. (2024). Penguatan Peran Kader dalam Upaya Percepatan Penurunan Angka Stunting di Desa Sidoagung, Kebumen. GEMAKES: Jurnal Pengabdian Kepada Masyarakat, 4(2).

Unicef. (2024). Gizi: Penyerahan Laporan Evaluasi Stunting. Unicef Indonesia.

World Health Organization. (2013). *Improving Child Nutrition: The Achievable Imperative for Global Progress*. Geneva: WHO.

World Health Organization. (2019). Nutrition Landscape Information System (NLiS). WHO.

Yunawati,dkk. (2023). Penilaian Status Gizi. CV. Eureka Media Aksara.

THE EFFECT OF EDUCATION WITH POSTER MEDIA ON INCREASING KNOWLEDGE OF HAND WASHING FAMILY OF INPATIENTS MEURAXA REGIONAL HOSPITAL, BANDA ACEH

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ABSTRACT

Hand washing is a process that mechanically removes dirt from the skin of the hands using soap and water. The research aims to determine the effect of education using poster media on increasing hand washing knowledge in families of inpatients at Meuraxa Hospital, Banda Aceh. Quantitative research design with a quasi-experimental design approach using the Pre-experimental method with one group pre-test post-test with family research subjects accompanying patients at Meuraxa Regional Hospital, Banda Aceh. The sampling technique used accidental sampling based on chance with a total of 94 people. The results of the level of knowledge before being given counseling were almost half sufficient, amounting to 41 (43.6%) and the total level of knowledge before being given counseling was mostly poor, amounting to 53 (56.4%) and the level of knowledge after being given counseling was mostly good, amounting to 57 (60.6%) and the level of knowledge after almost half of those providing counseling, amounting to 37 (39.4%) respondents. This research shows a significant p-value (0.000 < 0.05). Based on the results of the research above, it can be concluded that there is an increasing influence before and after providing counseling using poster media to the patient's family. This counseling is able to increase accuracy in washing hands according to the correct flow and procedures, this is due to clearer teaching. However, a small number of respondents have washed their hands but not properly, due to the age factor where respondents are aged 50-65 years, which is the beginning of old age, which means reduced ability to catch, so repeated explanations must be given . It is recommended for the patient's family to pay attention to procedures and steps for washing hands properly because this is the main thing to break the chain of spread of bacteria when in the hospital environment.

Keywords: Education, Poster Media, Washing Hands

INTRODUCTION

The Indonesian government is currently paying special attention to the incidence of nosocomial infections because cases of nosocomial infections in a number of hospitals in Indonesia show quite high numbers. The incidence of nosocomial infections indicates the low quality of health services. Nosocomial infections can occur considering that hospitals as health service centers are warehouses of infectious pathogenic microbes. On the other hand, health workers can also be a source, in addition to the patient's family who come and go, medical equipment and the hospital environment itself (Darmadi, 2018).

Hospitals are one of the public service facilities in the health sector that provide comprehensive services both promotive, preventive, curative and rehabilitative. While health education is a series of efforts aimed at influencing others, starting from individuals, groups, families and communities so that hand washing behavior is implemented (Erni, 2019). The number of nosocomial infections in Indonesia in 2018 was higher in general hospitals 23,223 out of 2,434,26 patients. While the number of infections in special hospitals was 297 patients out of 38,408 patients (Ministry of Health, 2020). Inpatient rooms with pediatric patients tend to have a higher risk of nosocomial infections, because when sick the child's immune system decreases coupled with invasive procedures in the child care process.

A prevalence survey conducted under WHO auspices in 55 hospitals from 14 countries representing four WHO regions (South-East Asia, Europe, Eastern Mediterranean and Western Pacific) revealed that, on average, 8.7% of hospital patients suffered from infections acquired in hospitals or other health facilities. At any given time, more than 1.4 million people worldwide suffer from complications of health-care-associated infections (WHO, 2019). According to Soeroso (2018) in developing countries including Indonesia, the average prevalence of nosocomial infections is around 9.1% with a variation of 6.1%-16.0%. A study revealed that washing hands can reduce the incidence of nosocomial infections by 20%-40%. However, the implementation of hand washing itself has not received a maximum response. In developing countries, failure to implement hand washing is often triggered by limited funds to provide hand washing facilities. However, when there are funds, the next obstacle that is actually most concerning is the lack of compliance to follow the procedure.

The incidence of nosocomial infections varies from one hospital to another. The number of nosocomial infections recorded in various countries ranges from 3.3% -9.2%, meaning that a percentage of patients treated are infected with nosocomial infections and can occur acutely or chronically. Health promotion education can improve knowledge, attitudes and handwashing behavior in families in hospitals. The use of lecture, demonstration and exercise methods can improve knowledge, attitudes and behavioral intentions of families about handwashing in hospitals. However, the use of poster media in the same study showed different results (Darmadi, 2018)

This nosocomial infection does not only affect patients, but can also affect all personnel in health services. Patients, health workers, visitors and patient attendants are groups at risk of nonsocomial infections, because these infections can be transmitted from patients to health workers, from patients to visitors or families or from officers to patients. Hand washing must be carried out in accordance with standard procedures to prevent the growth of germ microorganisms. Proper hand washing is in accordance with the six steps of hand washing and in accordance with the five moments of hand washing. The correct duration of hand washing using soap and running water is 40-60 seconds, if using handrub 20-30 seconds (Perdalin, 2019).

Studies in the United States show that the level of compliance of patient families in washing their hands is still around 50% and in Australia it is still around 65%. Similarly, the handwashing program at Cipto Mangunkusumo Hospital (RSCM) has been in place since 2012 but until now the compliance of patient families in washing their hands is only around 60%. This can be quite a challenge for the hospital infection control team to promote this handwashing program (Perdalin, 2019). Based on the results of a survey conducted by Triventiningtyas et al. (2021)

from a total of 325 patients in September with the same number for patient families, 290 or 70% of patient families at the Asoka Pavilion were not yet able to wash their hands properly.

According to WHO (2019), factors associated with nosocomial infections are: invasive procedures that damage normal barriers such as IV drips, overcrowded and understaffed rooms, antibiotic abuse, non-compliance with infection control regulations specifically for hand washing, and improper sterilization procedures. Meanwhile, Darmadi (2018) stated that one of the factors that plays a role in providing opportunities for nosocomial infections is as follows: intrinsic factors in patients (age, gender, general condition of the patient, risk of therapy, presence of other accompanying diseases and their complications). The impact of nosocomial infections causes losses due to emotional stress which can reduce the patient's ability and quality of life, the length of hospital care so that treatment costs increase, increased use of drugs, the need for patient isolation and increased need for supporting examinations and can cause death (Mariana, et al., 2019).

One of the methods used to prevent HAIs (nosocomial infections) is to implement universal precautions. One of the universal precautions is washing hands in hospitals. Fajriyah (2018) stated that a study showed that washing hands can reduce 20% -40% of the incidence of nosocomial infections, but the implementation of hand washing has not been responded to optimally. Several efforts have been made by hospitals to improve hand washing behavior, both in officers, facilities and patients/families. However, there are still obstacles, namely the lack of compliance to follow the procedure (Saragih & Natalina, 2020). According to Setiadi (2018), the health education learning process has the same goal, namely the occurrence of behavioral changes that are influenced by many factors, including educational targets, educational actors, educational processes and expected behavioral changes. The role of health education is expected to be one of the health interventions that can change one of the community's behaviors to wash hands using hand rub so that it can improve health levels.

Factors that influence visitor behavior towards infection prevention measures in the form of hand washing are individual characteristic factors (gender, age, type of work, level of education), psychosocial factors (attitude towards disease, stress, fear and perception of risk), management organization factors, knowledge factors, facility factors, motivation and awareness factors, place factors, and hand washing material factors on the skin (Tohamik, 2018). One of the most important efforts in preventing nosocomial infections is hand washing behavior because hands are the most efficient source of transmission for nosocomial infections. Facilities and posters on the steps to wash hands properly are available in every room in the Hospital, but based on survey results, it is known that there are still families who are reluctant to wash their hands for various reasons, including visitors admitting limited time used to wash their hands, patient conditions, and families stating that washing hands is something they feel is less practical to do. Conditions like this of course have an impact on the emergence of problems such as the occurrence of infection cases (Triventiningtyas et al., 2021)

Based on the results of the initial survey conducted on January 2, 2024, the total number of visitors to the Al-Bayan-2 Room was 1,611 male visitors in 2023. Meanwhile, the results of the initial observation showed that there were no hand washing facilities in the Meuraxa Hospital, Banda Aceh City.Based on the results of interviews with 7 families of patients, 5 families of patients out of 7 families of patients in the Al-Bayyan 2 room said they did not wash their hands before contact with patients and the hospital environment, 2 families of patients out of 7 families of patients said they washed their hands after contact with patients and the hospital environment, 1 family of patients out of 7 families of patients sat or rested on the patient's bed, 5 families of patients out of 7 families of patients said they used the same toiletries as the patient, 7 families of patients out of 7 families of patients threw garbage in the place provided, 5 families of patients out of 7 families of patients slept and stayed overnight in the patient's treatment room, 4 families of patients out of 7 families of patients brought children under the age of 12 when visiting the hospital, 7 people did not visit patients when their physical condition was not healthy, 5 families of patients out of 7 families of patients did not linger when visiting the hospital.

METHODS

The research design used in this study is quantitative research with a quasi-experimental design approach. This study uses the Pre-experimental method with one group pre-test post-test design. The study was conducted at the Meuraxa Banda Aceh Hospital on June 14 to July 02, 2024. The population in this study was the core family members accompanying patients at Meuraxa Regional Hospital, Banda Aceh, totaling 1,611 people. Determining the number of samples can be done by statistical calculations, namely by using the Slovin Formula. For the level of precision set in determining the sample is 10%. With a sample size of 94 respondents. The sampling method uses Accidental sampling, a sampling technique based on coincidence, namely anyone who accidentally or incidentally meets the researcher can be used as a sample. The knowledge indicator is to measure the extent of the patient's family's knowledge of the five moments of hand hygiene.

RESULTS AND DISCUSSION
Univariate Analysis

Table 1. Frequency Distribution Before and After Education Using Poster Media to Increase Knowledge in Patient Families at Meuraxa Regional Hospital, Banda Aceh

	Before			After		
No	Pre-Test	F	%	Post-Test	F	%
1	Good	0	0	Good	57	60.6
2	Enough	41	43.6	Enough	37	39.4
3	Not enough	53	56.4	Not enough	**0**	**0**

Based on table 1 above, it can be seen that the number of respondents' knowledge levels before being given counseling was almost half sufficient, amounting to 41 (43.6%) respondents and the number of respondents' knowledge levels before being given counseling was mostly lacking, amounting to 53 (56.4%) respondents. And the number of respondents' knowledge levels after being given counseling was mostly good, amounting to 57 (60.6%) respondents and the level of respondents' knowledge after being given counseling was almost half sufficient, amounting to 37 (39.4%) respondents.

Bivariate Analysis

Table 2. *Normality Test Results with* Kolmogorov-Smirnov

Variables	*P value*	Interpretation
Before Providing Education	0.00	Not Normally Distributed
After providing education	0.00	Not Normally Distributed

Based on table 2, the results of the Normality Test with Kolmogorov-Smirnov concluded that the p-value before being given Education ($\alpha > 0.000$), and the value *p-value* After being given Education ($\alpha > 0.000$) it can be concluded that all variables are not normally distributed, so the test used is the Wilcoxon Signed Ranks Test.

Table 3. Differences Before and After Education is Given
Using Poster Media to Improve Handwashing Knowledge in Patient Families

Level of knowledge	N	Mean rank	Min-max	z	*a*
Before	94	38.00	2-3	-7.770a	0.00
After	94	.00	1-2		

Based on table 3 above, the effect of using poster media on increasing handwashing knowledge in patient families before and after being given counseling using the Wilcoxn Signed Rank Test. with a mean rank value before being given counseling of 38.00 and after being given counseling of 0.00, a min-max value before being given counseling of 2-3 and after being given counseling of 1-2, a Z value of -7.770a and a significant value of 0.000.

Table 4. Wilcoxon Signed Rank Test Results Before and After Education

	After Education - Before Education
Z	-7.770a
Asymp. Sig. (2-tailed)	.000

Based on table 4 resultsWilcoxon Signed Rank Test before and after Education was given that Z count was -7.770a and significant at 0.001, this indicates that the significant value of 0.000 <0.05 (error level 5%). So it can be concluded that there is an influence before and after being given Education Using Poster Media on Increasing Handwashing Knowledge in Patient Families in the Inpatient Room of Meuraxa Hospital, Banda Aceh City.

Discussion

Based on table 4 resultsWilcoxon Signed Rank Test before and after Education was given that Z count was -7.770a and significant at 0.001, this indicates that the significant value of 0.000 <0.05 (error level 5%). So it can be concluded that there is an influence before and after being given Education Using Poster Media on Increasing Handwashing Knowledge in Patient Families in the Inpatient Room of Meuraxa Hospital, Banda Aceh City.

The results of this study are in line with the results of research conducted by Triventiningtyas et al. (2021) with the results of the study that the Wilcoxon statistical test obtained a significant number or probability value (0.000) which was much lower than the significant standard. 0.05 or (<), because < , which This means that there is an influence of the demonstration method of health education on the implementation of hand washing by patient attendants at the Asoka Pavilion, Jombang Regional Hospital. Also supported by the results of research conducted by Ananingsih (2020), dividing the research into 4 observations, namely: before the intervention, cycle I was carried out with socialization using posters, in cycle II by conducting hand hygiene training, and in cycle III by conducting hand hygiene simulations. The results of the compliance observation showed a difference with before the intervention in cycle III, the results showed an increase in compliance with 5 hand hygiene moments from 0% before the intervention to 40.83% in cycle III.

The results of the study in the intervention group on poster media obtained 100% results getting a score of 30-40 from 10 attitude statement items, the most wrong answers were 7 about washing very dirty hands can use alcohol-based liquids and 9 about the use of alcohol-based liquids takes 40-60 seconds. This shows a change in student attitudes towards being more positive after being given education through poster media of 0.89. Likewise, the respondents accompanying patients at Meuraxa Hospital, Banda Aceh, had significant changes in behavior or attitudes before and after being given health education using poster media. According to Rosenberg's theory, known as the Affective Cognitive Consistency theory, it states that in order to change or form attitudes, it can be done through cognitive components and affective components. Through the cognitive component, namely by providing knowledge, opinions, attitudes or other things, so that the material will change the affective component and ultimately the attitude will change. Through the affective component, namely providing things about feelings or emotions, so that with changes in feelings, the cognitive aspect will also change, which will ultimately change the attitude (Ahmadi, 2020).

Another opinion was put forward by Azwar (2021), who said that the attitude-forming structure is supported by three components, namely cognitive, affective and conative components. The cognitive component contains a person's beliefs that come from what is seen or known. Based on this, ideas, concepts or perceptions are formed that can shape attitudes. In addition, emotional

reactions which are affective components are strongly influenced by beliefs which are cognitive components. Then the behavior that appears as a direct form is part of the conative component which was previously influenced by emotions and beliefs so as to form certain attitude patterns towards various objects faced. However, this is different from the results of the study conducted by Antika (2022) in the study on the Influence of Buzz Groups on Actions Before and After Being Given Handwashing Media Booklets and Posters with Soap with the results of the study in the intervention group on poster media, namely a p-value of 0.595. There was an insignificant increase in actions after being given intervention through poster media.

According to Azrul Anwar (2020) health education or health counseling is an educational activity carried out by spreading messages, instilling beliefs, so that people are not only aware, know and understand, but also want and can carry out recommendations related to health. Meanwhile, according to Effendy (2021) health education or health counseling is a combination of various activities or opportunities based on learning principles to achieve a state, where individuals, families, groups or society as a whole want to live healthily, know how and do what can be done individually or in groups and ask for help if necessary.

The extension media used by researchers is in accordance with Daryanto's opinion (2021) that posters are image media that combine visual elements such as lines, images and words to attract attention and communicate messages briefly. Thus, posters are not only important for conveying the latest impressions but are able to influence others to participate in activities or programs that can be expressed through posters.

According to the researcher's view, health education counseling for patient families using poster media is able to increase accuracy in washing hands according to the correct flow and procedure. This is because there is clearer and more concrete teaching and the teaching process is more interesting, but a small number of respondents have washed their hands but incorrectly. This is due to age factors where most respondents are 50-65 years old, which is the age of early elderly, which means reduced comprehension so that repeated explanations must be given.

CONCLUSION

Based on the results of the study on the Influence of Education Using Poster Media on Increasing Knowledge of Hand Washing in Patient Families in the Inpatient Room of Meuraxa Regional Hospital, Banda Aceh, the conclusions in this study are as follows:
The results of the statistical test using the Wilcoxon Signed Rank Test obtained p = 0.000. It can be concluded that there is an influence before and after being given education using poster media on patient families in the Inpatient Room of Meuraxa Hospital, Banda Aceh.

ACKNOWLEDGEMENT

REFERENCES

Ananingsih, PD, & Rosa, E. M,. (2020). Compliance with 5 Moments of Hand Hygiene in Laboratory Officers of Cito Yogyakarta Clinical Action Research. JMMR J Medicoeticolegal And Hospital Management. Journal. Volume, 2. No 2, November 2020.

Annisa, N., Putra, M., & Putra, E. (2022). The effect of hand sanitizer use on hand washing compliance of patient families during the COVID-19 pandemic at Dr. Zainoel Abidin Regional Hospital, Aceh Province. Scientific Journal of Health Students. Retrieved from https://jim.bbg.ac.id/kesehatan/article/view/825

B, Elizabeth. Hurlock. (2018). Child development. Jakarta: Erlangga.

Darmadi. (2018). Nosocomial Infections: Problems and Control. Jakarta: Salemba.

Erni et al (2019). Factors Related to Compliance with 6-Step Handwashing First Moments in Patient Families in the Children's Room. Journal of Nursing and Midwifery, Volume 6, Number 2, August 2019

Ekawati, et al. (2018). Differences in the Use of Video Media and Leaflets on the Level of Student Knowledge Regarding Handwashing with Soap (Case Study at SDN Banyuanyar 1 Sampang in 2018). Journal of Echoing Environmental Health 16(1):181.

Putra, E., & Muhiddah. (2023). Level of knowledge of patient families with the implementation of COVID-19 health protocols in the Al Bayan I inpatient room, Meuraxa Regional Hospital. Global Health Science Journal. Retrieved fromhttps://ejournal.bbg.ac.id/ghsj/article/download/2101/1450/

Putra, E., Halizasia, G., Maulida, & Khairi, N. (2023). Influence of nurses' physical and mental workload with the implementation of the team method in Iskandar Muda Level IV Hospital inpatient room 07.01 Lhokseumawe. ICONESTH: BBG E-Proceeding. Retrieved fromhttps:// eproceeding. bbg.ac.id/ iconesth/ article/view/233.

THE EFFECT OF ENDORPHIN MASSAGE TO REDUCING PAIN INTENSITY AND INCREASING COMFORT IN THE FIRST STAGE OF LABOR IN PMB JAWIRYAH, S.ST

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ABSTRACT

Childbirth is a physiological process that will be experienced by every pregnant woman in her reproductive cycle. Changes that occur in the body to prepare for childbirth often cause pain in the mother. Labor pain often affects the physical and psychological condition of the mother, such as causing anxiety, fatigue, and reducing comfort, which can ultimately slow down the labor process (Fauzani, et al 2024). Ways to relieve labor pain can be done pharmacologically and non-pharmacologically. One non-pharmacological method to reduce pain during labor is endorphin massage. This study aims to determine the effect of endorphin massage on reducing pain intensity and increasing comfort in the first stage of labor. The research method used is a quasi-experimental design using a pre and post-test without control design. In this design, researchers only intervene in one group without a comparison. The sampling technique in this research was a total sampling technique with a sample of 40 respondents. the results of the Wilcoxon signed rank test before being given the distraction technique and after being given the distraction technique that the calculated Z is -5.477b and significant at 0.000. this shows that the significant value of 0.000 is smaller than 0.05 (5% error rate). So it can be concluded that there is a decrease in the level of normal labor pain in mothers from the results before being given Endorphine Message and after Endorphine Message. to overcome or teach ways to reduce pain in normal labor so that it can maintain excellence, so that joint services improve.

Keywords:Pain, Endorphine Message, Childbirth

INTRODUCTION

The World Health Organization (WHO) estimates that the maternal mortality rate worldwide is 440 per 100,000 live births and 98% occur in developing countries, while in Southeast Asia maternal mortality is 210 per 100,000 births. The lives of 8 million women worldwide are at risk and an estimated 529,000 women die each year as a result of complications arising from pregnancy and childbirth, most of which could actually be prevented by providing quality pregnancy services (WHO, 2018).

Based on the Indonesian Health Profile, there are five major causes of maternal death, namely bleeding (30.1%), hypertension in pregnancy (26.9%), infection (5.5%), obstructed labor (1.8%), abortion (1.6%), and others (34.5%) (Ministry of Health of the Republic of Indonesia, 2016). Data from the Aceh Provincial Health Office in 2021, the Maternal Mortality Rate (MMR) in Aceh Province in 2021 experienced a very significant increase of 223 per 100,000 live births (Aceh Health Profile, 2021). On the other hand, data from the Banda Aceh City Health Office. In 2021, it was recorded that there were 392 mothers giving birth in Meuraxa, 441 in Jaya Baru, 520 in Banda Raya, 810 in Baiturahman, 530 in Lueng Bata, 625 in Kuta Alam, 504 in Lampilo, 258 in Kuta Raja, 364 in Syiah Kuala, 333 in Jeulingke, and 576 in Ule Kareng (Banda Aceh City Health Profile, 2021).

Pregnancy, childbirth and postpartum period are physiological events in every development for women to become mothers. These physiological events can turn pathological or traumatic for the mother because of the pain she experiences. Some mothers are even traumatized to get pregnant and give birth again because they are afraid of experiencing the same pain. For mothers who have given birth, labor pain is the most painful pain, especially for mothers who are experiencing it for the first time (Felina et al., 2015). According to Humaira and Saragih (2016), in the United States 70% to 80% of mothers who give birth expect labor to be painless. In Indonesia, the percentage of cesarean section operations is around 5%. In government hospitals, the average is 11%, while in private hospitals it is around 20% to 50%.

Pain during labor and delivery is a unique and most severe painful event in a woman's life. More than 90% of mothers have experienced tension and stress during labor. In the Netherlands, it was reported that 54.6% of women who gave birth lost control in controlling labor pain. A study conducted in Sweden showed that 41% of participants reported that labor pain was the worst experience they had. Pain stimulates the sympathetic nervous system, which causes increased heart rate, blood pressure, sweat production, and Hyper Endocrine function (Herinawati, 2019). Labor pain experienced by every woman who has given birth has a psychological impact, so that every woman who experiences pregnancy imagines labor pain, especially women who have had unpleasant experiences during their first labor process (Pratiwi, et al., 2016).

Endorphin massage therapy, reducing the patient's concentration of stimulation, can reduce anxiety and the sensation of pain. Relaxation is one of the psychological effects of massage therapy which can reduce heart rate, breathing and metabolism. Massage is given to the mother in a side-lying position, with a pillow positioned behind her back and between her legs for support. Medium pressure is applied in the following sequence for 10 minutes. Massage starts with the head and neck then moves to the back, waist and legs. Pregnant women who are about to give birth experience increased pain which causes increased levels of cortisol and norepinephrine and low levels of dopamine and serotonin, then give birth to newborns with symptoms such as depression, increased levels of cortisone and norepinephrine (stress hormones) and lower levels of dopamine and serotonin. , (Sulistiyawati, 2020).

Based on data obtained from the Jawiriyah Independent Midwife Practice (PMB) in January 2024, 8 mothers giving birth in the first active phase at the birthing place said that the labor process was very painful and they said they could not stand the pain, especially in the first stage. The mother felt pain in the stomach, waist, back, and spreading to the spine, and felt the labor pain getting worse as the dilation increased. Therefore, it is necessary to conduct research on the effectiveness of massage in reducing pain intensity in mothers giving birth in the first active phase

Based on the results (Sulistiyawati, 2020) of the study, a significant decrease in pain intensity was found after being given endorphin massage. The results of the study before being given endorphin massage experienced very severe pain 18 people (75%), and after being given endorphin massage experienced a change in experiencing moderate pain 17 people (70.83%). In this study, endorphin massage was given during contractions. Endorphin massage can have a physiological effect on the body. In this study, a value (P = 0.000) was obtained after being given treatment, this shows that endorphin massage has a significant effect on reducing pain in mothers in the first stage of active phase labor. Giving endorphin massage to mothers in labor is a relaxation technique to reduce pain, endorphin consists of 30 amino acid units such as ketocholamines, corticotrophin, cortisol which are produced by the body to relieve pain and reduce stress. This relaxation process strengthens the bond between husband and wife in preparation for childbirth. The touch that is done helps increase the release of the hormone oxytocin and through increased endorphins, signal transmission between nerve cells can reduce the pain threshold.

This is supported by research (Maita, 2021) on mothers in labor showing a significant decrease in the pain scale before and after being given the deep back massage method, based on the statistical test p value: 0.004 (p <0.05). From the results of the study, it can be seen that there is a difference in the intensity of labor pain in the first stage of the active phase of physiological labor. From the results of the study, there was a significant difference in pain before and after being given a deep back massage.

METHOD

The research design used in this study is quantitative research with a quasi-experimental design approach. This study uses the Pre-experimental method with one group pre-test post-test design. The post-test was carried out as a benchmark for the intervention given on the same day. If the post-test is carried out on a different day, there is concern about information bias. The sample in this study was some mothers who underwent active phase 1 labor at the Independent Practice of Midwife Jawiryah, S. ST in the Banda Aceh City area as many as 45 respondents. The sampling technique in this study was the total sampling technique.

RESULTS AND DISCUSSION
Univariate Analysis

Table 2 Frequency Distribution of the Effect of Endorphine Messages on Reducing Pain Intensity and Increasing Comfort

No.	Before Being Given Endorphine Message			After Being Given Endorphine Message		
	Pre-Test	F	%	Post-Test	F	%
1	Mild pain	8	20	No pain	2	5.0
2	Moderate pain	32	80	Mild pain	32	85.0
				Moderate pain	6	10.0
	Total	40	100%	total	40	100

Source: primary data (processed in 2024)

Based on the results of the study related to the frequency of the effect of reducing pain levels before being given Endorphine Message (Pre-Test), a small portion was categorized as mild pain, as many as 8 people (20%) and the majority was categorized as moderate pain, as many as 32 people (80%). While the level of pain after being given Endorphine Message (Post-Test), the majority was categorized as no pain, as many as 2 people (5.0%), while those categorized as mild pain were 31 (85.0%) and those categorized as moderate pain were 6 people (10.0%).

Bivariate Analysis

Table 3 Results of Normality Test with Kolmogorov-Smirnov

Variables	*A*	Interpretation
Before Endorphine Message	0.00	Not Normally Distributed
After Endorphine Message	0.00	Not Normally Distributed

Source: primary data (processed in 2024)

Based on the results of the normality test with Kolmogorov-Smirnov, it was concluded that the p value before the distraction technique was given ($\alpha > 0.000$), and the p value after the distraction technique was given ($\alpha > 0.000$), it can be concluded that all variables are not normally distributed, so the test used is the Wilcoxon Signed Ranks Test.

Table 4 Differences in Pain Levels Due to Normal Childbirth Before Endorphine Message and After Endorphine Message

Pain Level Reduction	N	Mean rank	Min-max	Z	a
Before Endorphine Message	40	1.80	1-2	-5,477	0,000
After Endorphine Message	40	1.05	0-2		

Source: Primary Data processed in 2024

Based on the test results of the difference in pain levels due to normal labor before Endorphine Message and after Endorphine Message using the Wilcoxon Signed Rank Test. The results of the Wilcoxon Signed Rank test with a mean rank value before Endorphine Message 1.80 and after Endorphine Message 1.05 min-max value before Endorphine Message 1-2 and after Endorphine Message 0-2, the Z value is -5.477a and significant at 0.000.

Table 5 Results of the Wilcoxon Signed Rank Test Before Endorphine Message and After Endorphine Message

Test Statisticsb

	POST TEST - PRE TEST
Z	-5,477b
Asymp. Sig. (2-tailed)	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

Based on the results of the Wilcoxon signed rank test before being given the distraction technique and after being given the distraction technique, the calculated Z was -5.477b and significant at 0.000. This shows that the significant value of 0.000 is smaller than 0.05 (5% error rate). So it can be concluded that there is a decrease in the level of normal labor pain in mothers from the results before being given Endorphine Message and after Endorphine Message.

Decrease Pain Level Due to Normal Childbirth Before Endorphine Message and After Endorphine Message

Based on table 2 above, it shows that the level of pain due to normal labor before the administration of Endorphine Message (Pre-Test) was found to be a small portion categorized as moderate pain as many as 32 people (80%) and the majority categorized as mild pain as many as 8 people (20%). While the level of pain after the administration of Endorphine Message (Post-Test) was found to be mostly categorized as no pain as many as 2 people (5.0%), while those categorized as mild pain as many as 31 (85.0%) and those categorized as moderate pain as many as 6 people (10.0%).

This study began with a pretest where researchers observed mothers in labor who experienced pain during normal labor based on an observation sheet with 4 levels of pain, namely no pain, mild pain, moderate pain, and severe pain, to see the difference before and after being given endorphine messages. The

results of the pretest before being given endorphine messages showed that most patients still experienced pain during labor.

After the pretest was conducted, patients who were going to have a normal delivery were given an endorphin message, and after the post-test was conducted, the researcher conducted another observation and found that most of the patients who experienced pain during normal delivery experienced a significant decrease in pain levels so that there were 2 patients who did not experience pain (5.0%) respondents and 32 respondents (85.0%) with mild pain.

Pain relief is a basic need and right of mothers in labor. Pain relief methods can be grouped into two categories, namely non-pharmacological and pharmacological. Pharmacological is a technique for reducing pain using drugs. Non-pharmacological is a technique for reducing pain without using drugs including relaxation, hypnosis, guided imagery, massage, music therapy, distraction, warm compresses and cold compresses (Handayani, 2020).

Based on the results of a study conducted by Khasanah and Sulistyawati (2020) after being given an endorphin massage intervention in reducing the intensity of labor pain from 24 respondents, before being given an endorphin massage, 18 people (41.6%) experienced very severe pain, after being given an endorphin massage experienced moderate pain 17 people (50%) because endorphin massage on the back can reduce pain so that it makes the mother give birth more comfortable. Meanwhile, the results of a study by Tanjung and Antoni (2019) after being given an endorphin massage from 16 respondents experienced a decrease in pain intensity, namely: 2 respondents (12.5%) severe pain, 12 respondents (75%) moderate pain and 2 respondents (12.5%) mild pain.

Similar to the research conducted by Karuniawati (2019) from 22 respondents there was a decrease in pain intensity after being given endorphin massage, namely 8 respondents (36.4%) severe pain, 11 respondents (50%) moderate pain, 3 respondents (13.6%) mild pain because this light touch and massage provide a relaxing effect. Meanwhile, the results of Fitriana and Putri's (2017) study from 30 respondents, the average pain value after a 5-minute massage was 6.13 while the average value after a 15-minute endorphin massage was 6.73.

The researcher's assumption before giving endorphin massage (pretest) with observation using observation sheet with 4 levels of pain including no pain, mild pain, moderate pain, severe pain, it was found that most respondents still experienced severe pain and did not know how to reduce the pain. Most of the mothers who gave birth normally who were observed before being given distraction technique were still afraid and cried when the infusion was installed.

Furthermore, in the post-test stage, the researcher assumed that respondents who had been given endorphin massage experienced a difference because they had been given endorphin massage, although it was not perfect in eliminating pain, respondents saw a gradual change, starting from moderate pain to mild pain.

Discussion of Normality Test and Differences in Hallucination Development Before Endorphine Message and After Endorphine Message

Based on the table above, the results of the normality test with Kolmogorov-Smirnov conclude that the p value before the distraction technique was given ($\alpha > 0.000$), and the p value after the distraction technique was given ($\alpha > 0.000$), it can be concluded that all variables are not normally distributed, so the test used is the Wilcoxon Signed Ranks Test.

Based on table 3, the difference in the level of normal labor pain before and after endorphin massage using the Wilcoxon Signed Rank Test. The results of the Wilcoxon Signed Rank test with a mean rank value before endorphin massage of 1.80 and after endorphin massage of 1.05, the min-max value before endorphin massage 1-2 and after endorphin massage 0-2, the Z value is -5.477b and significant at 0.000.

Based on the statement above, it can be concluded that there is a significant difference before and after endorphin massage is given due to the provision of endorphin massage in visual form and monitored using an observation sheet according to the level of pain in the mother giving birth.

According to Dewi's research (2023), the results of the study before being given endorphin massage experienced very severe pain 18 people (75%), and after being given endorphin massage experienced a change to experiencing moderate pain 17 people (70.83%). In this study, endorphin massage was given during contractions. Endorphin massage can have a physiological effect on the body. In this study, a value ($P = 0.000$) was obtained after being given treatment, this shows that endorphin massage has a significant effect on reducing pain in mothers in labor in the first active phase.

In addition, the results of this study are reinforced by research conducted by Karuniawati (2022), with 35 respondents given endorphin massage intervention, there was a decrease in pain intensity from before and after endorphin massage was given. The decrease in intensity can be seen from the mean value before being carried out of 6.94 and the mean after the intervention was 4.74 so that there was a decrease in pain intensity of 2.2. This is reinforced by the results of the Wilcoxon analysis test, which obtained a sig value of 0.000. This study is also in line with the study conducted by Sulistyawati (2020). Based on the results of the study, a significant decrease in pain intensity was found after being given endorphin massage. The results of the study before being given endorphin massage experienced very severe pain 18 people (75%), and after being given endorphin massage experienced a change in experiencing moderate pain 17 people (70.83%). In this study, endorphin massage was given during contractions. Endorphin massage can have a physiological effect on the body. In this study, a value ($P = 0.000$) was obtained after being given treatment, this shows that endorphin massage has a significant effect on reducing pain in mothers inpartu in the first active phase.

CONCLUSION

The level of pain due to normal labor before and after endorphin massage was very significant. There was a decrease in the level of pain in normal labor in mothers from the results before and after Endorphine Message. To overcome or teach how to reduce pain in normal labor so that midwives at the service can maintain excellence, so that the quality of service improves, with the help of 60 APN (normal labor care).

ACKNOWLEDGEMENT

It is expected that this study can provide a means of information or knowledge for health workers, especially for midwives at PMB Jawiryah, S, ST. Banda Aceh City to be used as an alternative therapy without drugs to reduce the intensity of labor pain and provide comfort to mothers giving birth.

REFERENCES

World Health Organization, 2018, Marternal Mortality.https://www.who?newsroom/fact-sheets/detail/maternal-mortality-93k

Ministry of Health of the Republic of Indonesia. 2016. Indonesian Health Profile 2016. Jakarta. Ministry of Health of the Republic of Indonesia.

Banda Aceh City Health Office. 2020. Aceh Health Profile 2020. Aceh. Banda Aceh City Health Office.

Felina, M., Masrul, & Iryani, D. 2015. The Effect of Hot and Cold Compresses on Reducing Pain in the First Stage of Active Phase of Physiological Labor in Primiparous Mothers. Andalas Health Journal.

Humaira, W. and Saragih, HS (2016). The Effect of Classical Music Therapy on the Intensity of Pain in the First Stage of Labor. At Dina Maternity House, Jalan Bromo, Medan Area District', 05, pp. 178–190.

Pratiwi, D., Wagiyo, Nurullita, U. (2015). Differences in the Effectiveness of Counter-Pressure Techniques and Warm Compresses on Reducing Pain in the First Stage of Active Labor at Sunan Kalijaga Demak Regional Hospital. Journal of Nursing and Midwifery (JIKK).

Rahman, SA, Handayani, A., Sumarni, Mallongi, A. (2017). Reducing Labor Pain with Warm Compress and Effleurage Massage. MKMI JournalVol. 13 No 2.

Siyoum M, Mekonnen S. 2019. Labor pain control and associated factors among women who gave birth at leku primary hospital, southern Ethiopia. BMC research notes.

Jannah, N. 2019. Askeb II: Competency-Based Childbirth. Jakarta: ECG

Tazkiyah, I, K. & Yanti. (2014). The effect of massage techniques on reducing labor pain in the first active phase. Journal of midwifery Vol. 6, No 01.

Supliyani, E. (2017). The Effect of Back Massage on the Intensity of First-Stage Labor Pain in Bogor City. Journal of Midwives, 3(1), 234041.

Leny, Rr Catur. Machfudloh. Endorphin Massage Therapy to Reduce Pain Intensity in the First Stage of Active Labor Phase. Journal of Smart Midwifery,

Antik, A., Lusiana, A., & Handayani, E. (2017). The Effect of Endorphine Massage on the Pain Intensity Scale of the First Stage of Active Labor. Journal of Midwifery, 6(12), 1-16.

Dewie, A., & Kaparang, MJ (2020). Effectiveness of Deep Back Massage and Endorphin Massage on Pain Intensity of Active Phase I in BPM Setia. Poltekita: Journal of Health Sciences, 14(1), 43-49.

Noviyanti, Astuti, et al. (2016). The Effect of Massage Therapy on Reducing Pain in the First Stage of Active Labor in Women in Labor (Case Study of Bandung City). The Southeast Asian Journal of Midwifery, 2(1), 1-8.

Ulya, Y., Annisa, N, H., Idyawati, S., (2019). The Effect of Deep Back Massage Method on Labor Pain in the First Active Phase. Mahakam Midwifery Journal, Vol 3, No. 1, November 2019

Kartikasari, R, I., & Nuryanti, A. (2016). The Effect of Endorphin Massage on Reducing the Intensity of Back Pain in Pregnant Women. Aipkema National Working Meeting

Sulistyawati, W. (2020). The Effect of Endorphin Massage on Pain Intensity in Women Giving Birth. Vol. 3 No. 1 March 2020

FACTORS AFFECTING MATERNAL COMPLIANCE IN THIRD TRIMESTER ANTENATAL CARE AT NURUSSALAM HEALTH CENTER IN EAST ACEH DISTRICT IN 2024

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ABSTRACT

The high maternal mortality rate in Indonesia is related to many factors, one of which is pregnancy, where complications during pregnancy are not detected because pregnant women do not utilize ANC. Problems that occur in pregnancy can be prevented by pregnancy check-ups. The importance of ANC visits is not yet a top priority for most pregnant women. Based on Green's theory, there are predisposing factors (education, knowledge), reinforcing factors (husband support) and enabling factors that can influence a person's behavior. This study aims to determine the factors that influence the compliance of pregnant women in third trimester pregnancy checks at the Nurussalam Health Center, East Aceh Regency in 2024. This type of research is observational analytic, survey method and cross sectional design. This study was conducted at the Nurussalam Health Center, East Aceh Regency in April-May 2024. The sample was TMT III pregnant women totaling 40 people taken by accidental sampling. The study showed that the compliance of TMT III pregnancy examination in the majority was not compliant, namely 24 respondents (60%). There is a relationship between maternal education and compliance with TMT III pregnancy check-ups with a Pvalue = 0.001 < a = 0.05. There is a relationship between maternal knowledge with TMT III pregnancy check-up compliance with a Pvalue = 0.014 < a = 0.05. There is a relationship between husband's support with TMT III pregnancy check-up compliance with a Pvalue = 0.021 < a = 0.05. It is hoped that this study can be a reference to be able to check their pregnancy regularly in accordance with current regulations, so that obstetric and neonatal emergencies can be managed early so as to reduce morbidity and mortality of both mothers and babies.

INTRODUCTION

Pregnancy is a matter that involves several changes including physiological, biological, and psychological changes in women. Physiological changes that occur are the process of zygote formation and eventually become a fetus that will develop until the delivery process. Meanwhile, hormonal changes in pregnant women are part of the mother's response to pregnancy which can cause stress, changes in feelings, such as during menstruation or menopause. Therefore, these pregnant women need to be supervised by health workers related to the health of the mother and the fetus in her womb. (Citrawati, 2021). One form of surveillance to measure the level of health of pregnant women is the maternal mortality rate. Globally, in 2020 there were 152 maternal deaths per 100,000 live births. In Indonesia, the maternal mortality rate reached 183 per 100,000 live births, which is still far from the SDGs target of 70 per 100,000 live births by 2030 (Kemenkes, RI, 2021). The high maternal mortality rate in Indonesia is related to many factors, one of which is pregnancy, where complications during pregnancy are not detected because pregnant women do not utilize ANC at health services so that their pregnancies are at high risk. In 2019, the most common causes of maternal death were bleeding (1,280 cases), hypertension in pregnancy (1,066 cases) and infection (207 cases). The Aceh Health Profile in 2020 shows the highest Maternal Mortality Rate (MMR) with 172 maternal deaths. The highest cause of maternal death in Aceh is still dominated by bleeding at 32 percent (Aceh Health Profile, 2020). The health profile of East Aceh District in 2021 the maternal mortality rate in East Aceh District was 194 per 100,000 live births (17 cases of maternal death). (East Aceh District Health Office, 2021). Data on Antenatal Care (ANC) visits in Indonesia tend to fluctuate, this is indicated by data on K1 and K4 coverage in 2018 K1 coverage was 95.65 percent and K4 coverage was 88.03 percent and in 2019 K1 coverage was 96.4 percent and K4 coverage was 88.54 percent. In 2021, K4 coverage in Indonesia reached 88.8% and K6 63 percent. Aceh Province has K1 coverage of 90 percent, K4 coverage of 78.1 percent and K6 coverage of 41.6 percent, this coverage is still below the RPJMN (National Medium Term Development Plan) standard of 86 percent (Ministry of Health, 2022). Based on secondary data obtained from March to August 2023, there were 198 third trimester pregnant women in the Nurussalam Health Center working area. Of the 198 pregnant women, as many as 120 (60.6%) pregnant women complied with the K1-K4 Antenatal Care (ANC) visit according to the standard and there were 78 (39.4%) third trimester pregnant women who did not comply with the Antenatal Care (ANC) visit. In addition to health problems, the high number of cases of maternal mortality is also due

to the lack of women's empowerment, education level, local culture, economy, and lack of husband's attention to pregnant women. Maternal and infant mortality can be prevented if complications and risks experienced can be detected early, so that immediate treatment can be obtained. One of the treatments that can prevent the death of pregnant women is ANC (Antenatal Care) handling (Nainggolan, 2021). One of the efforts to accelerate the reduction in maternal mortality rate (MMR), infant mortality rate (IMR) and pregnancy problems in pregnant women is to carry out antenatal care. Antenatal Care (ANC) is a service provided to women during their pregnancy. Antenatal care is considered very important in ensuring that both the mother and the fetus will survive both during pregnancy and during labor.

METHODS

This type of research is analytic with survey research methods. This research collects information by compiling a list of questions asked to respondents in the form of a sample of a population. The purpose of survey research is to find the incidence, distribution and relationship between variables related to social phenomena. This study analyzes the factors that influence maternal compliance in the third trimester pregnancy examination. This study used a cross sectional design, namely the measurement of the dependent variable (maternal compliance in TMT III pregnancy check-ups) was observed or measured simultaneously with the independent variables of Education, Knowledge and Husband Support, at one specific time. The sample in this study were all pregnant women TMT III with a gestational age of 40 weeks, where the sample in this study used accidental sampling, namely the sampling technique based on chance, namely any patient who happened to meet the researcher.

RESULTS AND DISCUSSION

Individual Characteristics
Every individual has innate characteristics (heredity) and characteristics that are influenced by the environment. The individual characteristics seen in this study include age, education, occupation, and parity. The individual characteristics in this study can be seen in table 4.1.1 below

Table 1
Frequency Distribution of Individual Characteristics Based on Age,
Education, Occupation and Parity in the Working Area
Nurussalam Health Center

No	Characteristics	Total	Presentation (%)
1	**Umur**		
	<35 tahun	22	55
	≥35 tahun	18	45
	Total	**40**	**100**
2	**Education**		
	Elementary	2	5

	ool	5	30
	Senior hight school	21	45
	university	12	20
	Total	**40**	**100**
3	**Work**		
	Housewife	17	42,5
	Government employees	12	30
	Self-employed	11	27,5
	Total	**40**	**100**
4	**Paritas**		
	Primipara (< 2)	20	50
	Mutipara (≥ 2)	8	20
	Grande Multipara (> 2)	12	30
	Jumlah	**40**	**100**

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Table 2
Frequency Distribution of the Effect of Maternal Knowledge on
TMT III Pregnancy Examination at the Puskesmas
Nurussalam Health Center, East Aceh Regency

N o	Maternal Knowledge	Pregnancy Checkup Compliance TMT III						Pvalue X^2
		Compliant		Non-compliant		F		
		F	%	F	%	N	%	
1	**Good**	11	61,1	7	38,9	18	100	**0,014**
2	**Not so Good**	5	22,7	17	77,3	22	100	
	Total	**16**		**24**		**40**		

The results of the Chi-Square (X2) test are Pvalue = 0.014 < a = 0.05, so H0 is rejected, meaning that there is an influence between maternal knowledge on compliance with TMT III pregnancy checks at the Nurussalam Health Center, East Aceh Regency.

The results of this study are in line with research conducted by Maria Pricilia Grace Taolin, et al (2022) on Factors Affecting the Visit of Pregnant Women in conducting Antenatal Care at the Kupang City Health Center. The results showed that there was an influence on the level of knowledge of pregnant women on antenatal care visits with a value of p = 0.000 (p <0.05). Respondents' compliance in ANC examination is also influenced by education possessed by pregnant women, socioeconomic status and parity. Mother pregnant women with higher education tend to be able to receive the information provided so as to increase their knowledge and information provided so that it can increase the knowledge possessed and can take a wiser and more obedient attitude to conduct pregnancy visits

Table 3

Frequency Distribution of the Effect of Husband Support on Compliance with TMT III Pregnancy Checkup at Nurussalam Health Center, East Aceh District

No	Husband Support	Pregnancy Checkup Compliance TMT III						Pvalue X^2
		Support		Support		F		
		F	%	F	%	N	%	
1	Support	9	64,3	5	35,7	14	100	0,021
2	Not-Supportive	7	26,9	19	73,1	26	100	
	Jumlah	**16**		**24**		**40**		

The results of the Chi-Square (X2) test are Pvalue = 0.021 < a = 0.05, so H0 is rejected, meaning that there is an influence between husband support on compliance with TMT III pregnancy checks at the Nurussalam Health Center, East Aceh Regency.

The results of this study are in line with Evi Holiday's research (2021) Factors Associated with Pregnancy Examination at the Keramasan Palembang Health Center in 2021. Chi-Square statistical test at the level of meaning   = 0.05 obtained p value = 0.008 which means that there is a relationship between husband's support and pregnancy examination so that the hypothesis stating that there is a relationship between husband's support and pregnancy examination is statistically proven. The Odds Ratio result obtained a value of 5.571 which means that good husband support has a 5.571 times greater chance of adhering to pregnancy checks compared to less husband support.

The researcher assumes that the importance of ANC visits is not a top priority for most pregnant women. Non-compliance with scheduled ANC visits leads to unmonitoring of various obstetric complications that can endanger the life of the mother and fetus so that it can cause high morbidity and mortality. Many factors influence the health behavior of pregnant women in utilizing antenatal care, namely predisposing factors (age, education, occupation, parity, knowledge and attitudes), enabling factors (distance of residence, family income and information media facilities) and reinforcing factors (husband support, family support and health worker support). Integrated Antenatal Care is a comprehensive and quality service, which aims to fulfill the right of every pregnant woman to obtain quality antenatal care so that she is able to undergo a healthy pregnancy, deliver safely, and give birth to a healthy baby (Kemenkes RI, 2019). All pregnant women and their husbands/families are expected to participate in at least 1 meeting. To get integrated and comprehensive services according to standards at least 6 times during pregnancy.

CONCLUSION

1. There is an influence between maternal education on maternal compliance in conducting TMT III pregnancy checks at the Nurussalam Health Center, East Aceh Regency.
2. There is an influence between knowledge on maternal compliance in conducting TMT III pregnancy checks at the Nurussalam Health Center, East Aceh Regency.

3. There is an influence between husband's support on maternal compliance in conducting TMT III pregnancy checks at the Nurussalam Health Center, East Aceh Regency.

ACKNOWLEDGEMENT

Thank you to all parties involved in this research so that the research can be completed well.

REFERENCES

Citrawati, N. K., & Laksmi, I. G. A. P. S. (2021). *Hubungan Pengetahuan Ibu Hamil Tentang Anc Terhadap Kunjungan Anc Di Puskesmas Tampaksiring Ii*. Jurnal Keperawatan Sriwijaya, 8(2), 19–26. https://doi.org/10.32539/jks.v8i2.15299.

Fauziah, A, dkk, 2023, *Faktor Yang Berhubungan Dengan Kepatuhan Ibu Hamil Dalam Melakukan Kunjungan Antenatal Care : Literatur Review*, Journal Of Pharmaceutical and Sciences, Volume 6 No 1; 2023; hal 127-131.

Gates Foundation. 2021, *Maternal Mortality* [Internet]. [cited 2022 May 16]. Available from: https://www.gatesfoundation.org/goalkeepers/report/2021-report/progress-indicators/maternal-mortality

Kemenkes RI. 2019, *Profil Kesehatan Indonesia 2019*. Kementrian Kesehatan Republik Indonesia.

Kementerian Kesehatan Republik Indonesia. 2018, *Pentingnya Pemeriksaan Kehamilan (ANC) di Fasilitas Kesehatan* [Internet]. Available from: https://promkes.kemkes.go.id/pentingny a-pemeriksaan-kehamilan-anc-di-fasilitas-kesehatan

Kurniasari, Devi. 2016, *Faktor – Faktor Yang Mempengaruhi Kunjungan Kehamilan Di Puskesmas Kesumadadi Kabupate Lampung Tengah Tahun 2016*. Kebidanan ;vol 2. No:159–68.

Nainggolan SS & Junie H. 2021. *Faktor yang Berhubungan Dengan Antenatal Care Pada Hubungan Hamil : Literature Review*. Jurnal Aisyah Medika, Vol 6 (2) 128-146

Notoatmodjo S. 2014, *Ilmu Perilaku Kesehatan*. Jakarta: PT Rineka Cipta.

Susiana S. 2019, *Angka Kematian Ibu: Faktor Penyebab dan Upaya Penanganannya. Info Singk Kaji Singk Terhadap ISU Aktual dan Strateg* [Internet].;XI. Available from: https://berkas.dpr.go.id/puslit/files/info_singkat/Info Singkat-XI-24-II-P3DI- Desember-2019-177.pdf

Sugiyono (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung : Alphabe

Wati, A.H, dkk (2023), *Ketidakpatuhan Kunjungan Antenatal Care Pada Ibu Hamil Trimester III Berdasarkan Karakteristik Individu*, Jurnal Kesehatan Masyarakat, Vol. 11 No. 2, Agustus 2023, Hal. 128-135.

APPENDIX
(if any)

The Effect of Finger Painting on Fine Motor Development in Children in Aceh: A Case Study

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ABSTRACT

Fine motor skills involve the use of small muscles, such as those in the fingers and wrist, working in coordination with the eyes and hands to achieve specific skills with precision. Delays in fine motor skills, if not addressed, can lead to various consequences such as a lack of interest in learning and creativity. One way to improve children's fine motor skills is through finger painting activities. Finger painting engages the small muscles in the wrist, arms, and fingers, while coordinating with the eyes and brain, thus helping to enhance fine motor development. This study aims to assess the implementation of finger painting activities in improving fine motor skills in preschool children, involving two children in Aceh. This descriptive study uses a case study approach, with data collected through interviews and observations before and after the finger painting activity. The study was conducted over 7 days at a Kindergarten in Aceh. The results showed that finger painting activities were effective in improving fine motor skills. For Subject I, an improvement in fine motor skills was observed after the finger painting activity was implemented. The same result was found for Subject II, with an increase in fine motor skills before and after the activity. It is expected that the implementation of finger painting activities can be applied as a method to enhance fine motor skills in preschool children.

Keywords: *Finger painting, Fine motor skills, Preschool children.*

INTRODUCTION

A child is a unique individual with needs that align with their developmental stage. Each child has different needs according to their growth

and development. Physiological needs, such as nutrition, hydration, physical activity, elimination, sleep, and others, are essential, while psychological, social, and spiritual needs are evident as the child develops (Soetjiningsih, 2013).

Preschool children, aged 4 to 6 years, are still dependent on adults or parents to meet their basic needs. One of the fundamental needs for preschool children is ensuring their growth and development are optimal for their age (Soetjiningsih & Ranuh, 2013). Child development includes cognitive, physical (motor), language and communication, and personal, social, and emotional aspects. When it comes to motor skills, children need to develop gross motor skills such as walking, running, jumping, and climbing stairs, as well as fine motor skills like writing, drawing, cutting, and playing ball, including throwing and catching According to Soetjiningsih & Ranuh (2013), playing with toys plays an important role in children's development.

The World Health Organization (WHO) reported in 2018 that 28.7% of toddlers experienced growth and development issues, with Indonesia ranked third in Southeast Asia for the highest prevalence. The 2018 Basic Health Research survey revealed that about 11.7% of children aged 36-59 months faced developmental problems, with Bengkulu province showing a prevalence of 8.3% in this age group (Ministry of Health of the Republic of Indonesia, 2018).

The Aceh Health Profile (2021) shows that the highest rate of developmental disorders in preschool-aged children (toddlers) is found in Simeulue Regency, with 11%, and the lowest in North Aceh Regency, with 1%.

An initial survey conducted by the researcher at a kindergarten in Aceh found that there were 28 children in total. Based on interviews with the kindergarten teacher, it was found that, on average, the children were still struggling with tasks such as drawing, writing correctly, cutting along patterns, pasting images accurately, differentiating between their right and left hands, and tying their shoelaces.

Children aged 4 to 6 years, based on feedback from several mothers, generally lack an understanding of fine motor development and how to enhance these skills, particularly through activities like finger painting and its associated benefits. Fine motor skills impact other areas of development, such as language, social abilities, and self-confidence. Delays in fine motor skills can have long-term negative effects on a child's subsequent development (Nunung et al., 2017).

Therefore, efforts are needed to address these delays in fine motor skills through stimulation. Fine motor stimulation involves guiding, directing, and providing opportunities for preschool children to engage their small muscles. Some activities for stimulation include folding, drawing with crayons, playing with clay or dough, stringing beads, painting with watercolors, playing congklak, tracing, and finger painting. Finger painting is an activity where children paint with their fingers, which helps stimulate their imagination,

improves fine motor coordination, and sharpens their fine motor skills (Rudiyanto, 2016).

Finger painting is a technique of painting without any tools, where children apply paint to wet paper using their fingers, allowing them to express their imagination through artwork. This activity also helps train fine motor skills, teaches children to move their fingers more flexibly, and enhances hand-eye coordination. Through finger painting, children's fine motor skills, particularly in their fingers, are stimulated, and their creative ideas in painting are encouraged, helping to develop their motor coordination as they grow (Nina et al., 2015).

Finger painting or painting with fingers can enhance children's motor development, improve hand-eye coordination, and stimulate their imagination for creativity. It can also contribute to the development of cognitive abilities, such as recognizing finger names and various shapes and colors (Yunus, 2016). Research conducted by Lola et al. (2018) found that finger painting effectively improved fine motor development by 32.4% and creativity by 41.9%. Additionally, a study by Nunung et al. (2017) indicated a significant difference in children's fine motor skills before and after participating in finger painting, with a pre-test score of 4.00 and a post-test score of 6.00.

Furthermore, research by Nina Astria and Sulastri (2015) showed that after implementing finger painting in the first cycle, fine motor skills improved by 65.93%, which was categorized as moderate, and increased to 82.93% in the second cycle, categorized as high. These findings indicate a 17% improvement in fine motor skills. Based on these results, it can be concluded that implementing finger painting as a method of play can significantly enhance children's fine motor skills.

METHODS

This study is descriptive and utilizes a case study approach. The research was carried out by following steps such as data collection, classification, processing, and drawing conclusions (Setiadi, 2013). According to the above definition, field research refers to a study aimed at investigating events within a particular setting or environment. In this case, the research will be conducted at a kindergarten in Aceh.

RESULTS AND DISCUSSION

Based on the results of this case study, it can be concluded that the implementation of finger painting therapy can improve fine motor skills in preschool-aged children. The following explanation provides further details: The results from Subject I show an improvement in fine motor development. Specifically, the child demonstrated the ability to draw in detail through finger painting activities. Prior to the intervention, the child scored 1 (emerging

development), but after the finger painting intervention, the score improved to 3 (excellent development).

Similarly, for the skill of moving fingers, the score increased from 1 before the intervention to 3 after the finger painting activity. As for the sub-indicator of wrist flexibility, the score improved from 1 before the intervention to 2 after the intervention. Additionally, for the eye-hand coordination indicator, the score increased from 1 before the intervention to 2 after the finger painting activity was implemented.

Based on the results of the study for Subject II, there was also an improvement in fine motor development. For the indicator of the child's ability to paint in detail through the finger painting activity, before the intervention, the child scored 1 (emerging development), which increased to a score of 3 (excellent development) after the finger painting intervention. Similarly, for the skill of moving the fingers, the score increased from 1 before the intervention to 2 after the finger painting activity was implemented. For the sub-indicator of wrist flexibility, the score improved from 1 before the intervention to 2 after the intervention. Finally, for the indicator of eye-hand coordination, the score increased from 1 before the intervention to 2 after the finger painting activity was applied.

Based on the results of the study on the implementation of finger painting activities to improve fine motor skills in both subjects, conducted over 7 days, it was found that the application of finger painting therapy can enhance the development of fine motor skills in preschool-aged children.

The research results on Subject I before the implementation of finger painting showed that the subject experienced delays in writing, coloring according to patterns, difficulty focusing on learning, irregular drawing imitation, and a lack of concentration. However, after being given finger painting activities for 7 days, the results indicated that the subject was able to imitate shapes as demonstrated, mastered the required movements for the activity, and improved hand-eye coordination.

Similarly, for Subject II, prior to the implementation of finger painting, data showed delays in distinguishing colors, inability to arrange blocks, and difficulties in drawing and coloring according to patterns. The subject also had trouble focusing and imitating shapes. After 7 days of finger painting, the subject showed improvement, including the ability to imitate shapes as demonstrated, the ability to explain the shapes, increased flexibility in wrist movements with gradual pressure, and improved hand-eye coordination.

This demonstrates the positive impact of finger painting therapy on enhancing fine motor skills in children. The researcher assumes that applying finger painting for 7 days significantly improves fine motor skills in preschool children and is highly beneficial for their fine motor development. This aligns with Saputra & Susilowati's (2023) statement that finger painting can enhance fine motor skills in preschool children and is consistent with the nature of children, as this activity is categorized as constructive play.

Play is an essential aspect for children to express their behavior in a fun, pressure-free manner. The use of play-based learning is based on the consideration that genuine learning emerges when children have the freedom to choose their activities (Rohmah, 2016).

Factors that contributed to the success of finger painting therapy include adherence to instructions, the role of parents, the child's readiness, and the parents' level of education.

The first factor is the child's adherence to instructions. Both subjects were cooperative and followed the instructions given by the researcher during the finger painting sessions. This adherence significantly contributed to the success of the therapy. This is supported by Oktarina et al. (2020), who found that adherence to instructions plays a key role in the success of interventions.

The second success factor is the role of the parents in supporting the child's creativity. Both parents were very supportive in the study. The researcher believes that parental involvement was crucial to the success of the intervention. This is in line with Yanti & Fridalni's (2020) statement that parental involvement, particularly from mothers, is essential for success in early childhood development.

The third factor is the child's readiness to participate in the finger painting activity. Both subjects were willing to participate, follow the instructions, and engage with the activity. The researcher assumes that a child's readiness to participate directly influenced the success of the intervention. This is supported by Yumalasari & Aprianti (2022), who noted that a child's readiness is a critical factor in successful outcomes.

The fourth factor is the parents' level of education. The education level of parents can influence a child's development, as higher education often results in a better understanding of ways to enhance children's fine motor skills. In this study, both subjects had parents with high school educations. Parent education plays a role in understanding how to support fine motor skill development in children, as indicated by Adelia & Purwaningtyas (2018).

Fine motor skills are a crucial aspect of preschool education, as they play an important role in a child's development. Through play, children are encouraged to create, explore, and use objects in their environment (Nofianti, 2020). Before the implementation of finger painting, both subjects struggled with coloring and shape imitation. However, after the intervention, both subjects showed interest in the activity, successfully coloring patterns provided by the researcher.

Observations after the intervention showed that both subjects were able to color neatly and in accordance with the patterns, demonstrating improved fine motor skills, such as coloring in a controlled and precise manner. Evaluations revealed that the children's ability to imitate shapes and their hand-eye coordination improved, with wrist flexibility becoming more evident over time. The activities also improved the coordination between the children's hands and eyes.

This aligns with research by Maghfuroh (2017), who found a strong correlation between finger painting activities and the development of fine motor skills in preschool children, specifically in areas like coloring, hand-eye coordination, finger movements, and wrist flexibility. Similarly, other studies support the idea that finger painting enhances fine motor development in preschool children, with finger painting being an effective learning medium for teachers to use in the classroom. This approach can facilitate the learning process and help children absorb new material.

The researcher also notes that finger painting requires patience and attention to detail, as children color slowly and methodically. This activity helps develop fine motor skills by engaging the fine muscles in the hands. According to Kamilia et al. (2023), finger painting encourages coordination between the eyes and hands, stimulates imagination and creativity, and strengthens the muscles in the hands and fingers, all contributing to fine motor development.

The researcher assumes that Subject I showed faster improvement because they were already familiar with basic shapes such as triangles, squares, circles, and rectangles. The interaction between Subject I and the researcher was quicker, which helped the success of the finger painting activities. The environment and the child's readiness to engage in the activity are crucial factors in successful motor skill development. Nurlaili (2019) supports the idea that a conducive environment is essential for developing fine motor skills in children, as restricted movement can hinder their progress.

Factors influencing the development of fine motor skills in children include a history of seizures, poor nutrition, and age. Subject I, for example, had a history of seizures, which may have affected their fine motor development, as seizures are linked to motor skill disturbances (Ifalahma & Retno, 2023). Subject II had a history of poor nutrition, which can negatively impact physical and motor development (Aprilidia & Husada, 2019). Age also plays a role, as older children typically have more developed cognitive abilities, enabling them to better engage in learning activities. Both subjects were 5 years old, and Subject II demonstrated more rapid improvement, aligning with Susantono's (2018) observation that older children tend to progress faster in activities like finger painting.

CONCLUSION

Based on the results of this case study, it can be concluded that the implementation of finger painting therapy can improve fine motor skills in preschool children. The factors that influence the development of fine motor skills in children include adherence to instructions, parental involvement, the child's readiness, and the parents' level of education. Additionally, factors influencing fine motor development in Subject I were related to a history of

seizures, while in Subject II, it was influenced by a history of malnutrition. As a result, the children's fine motor skills improved. For other researchers, this study is expected to serve as an additional reference for investigating the development of fine motor skills in children through the application of finger painting activities.

ACKNOWLEDGEMENT

REFERENCES

Adelia. D. D & Purwaningtyas. F. (2018). Hubungan Tingkat Pengetahuan dan Peran Orang Tua dengan Perkembangan Motorik Kasar dan Motorik Halus pada Anak Usia 4-6 Tahun di TK Istiqomah Kelurahan Tlogomas Kecamatan Lowokwaru Kota Malang. Akademi Kebidanan Wira Husada Nusantara Malang.

Aprilidia & Husada, (2019) Gizi Kurang Sangat Mempengaruhi Perkembangan Fisik, Perkembangan Motorik dan Kognitif Anak.

Ifalahma & Retno. (2023) Kejang Merupakan Tanda dan Gejala Gangguan Perkembangan Motorik Halus Anak.

Kamilia, L., I., Amudariya, E & Anggraini, S., A. (2023). Pengaruh Finger Painting Terhadap Perkembangan Motorik Halus Anak Usia 4-5 Tahun TK Dharma Wanita Tegal Gede Jember. Pernik Jurnal PAUD. 2(6)

Kementrian Kesehatan Indonesia. (2010). *Profil Kesehatan Indonesia*. Jakarta: Kementrian Kesehatan RI.

Lola, dkk (2018). *Play Finger Painting in Creative Art Model to Help Smooth Motoric Development and Creativity of Group a in Kindergarten at Aek Loba Pekan Village*. AISTEEL, Eissn : 2548-4613

Magfuroh, L. Putri., K., C. (2017). Pengaruh Finger Painting Terhadap Perkembangan Motorik Halus Anak Usia Prasekolah di TK Sartika 1 Sumurgenuk Kecamatan Babat Lamongan. Stikes Muhammadiyah Lamongan.Jurnal Ilmiah Kesehatan. 10(1).

Nababan, R., Tesmanto, J. (2021). Perkembangan Motorik Halus Melalui Finger Painting pada Anak Kelompok Bermain di TK Advent Tahun Pelajaran 2020/2021. Jurnal of Education. 7(2).

Nina Astria & Sulastri (2015) Peningkatan Motorik Halus Setelah Penerapan Finger Painting.

Nofianti, R. (2020). Upaya Meningkatkan Keterampilan Motorik Halus Melalui Kegiatan Menggunting dengan Menggunakan Pola Pada Anak Usia Dini. Jurnal Model Pengembangan Keterampilan Motorik Anak Usia Dini. Jakarta. 13:1

Nunung Nurjanah, C. S. & B. D. A. P. (2017). Pengaruh Finger Painting Terhadap Perkembangan motorik Halus Anak Prasekolah Di TK At- Taqwa, *Volume 5*. Nurlaili. (2019). Pengembangan Motorik Halus Anak Usia Dini.

Oktarina, A., Saidy., Angraini. W & Susilawati. B. (2020). Penggunaan Media Kolase dalam Mengembangkan Keterampilan Motorik Halus Anak Usia 5-6 Tahun. Jurnal Ilmiah Pendidikan Anak Usia Dini. 3(2).187-200

Rohmah, N. (2016). Bermain dan Pemanfaatannya dalam Perkembangan Anak Usia Prasekolah. Universitas Islam Nahdlatul Jepara. Jawa Tengah.

Rudiyanto,A. (2016). Perkembangan Motorik Kasar dan Motorik Halus Anak Usia Dini (Pertama). Darussalam Press Lampung.

Saputra & Susilowati (2023). Meningkatkan Motorik Halus Anak Prasekolah. Setiadi, (2013). Menempuh Langkah-Langkah Pengumpulan Data ,KLasifikasi Pengolahan, Membuat Kesimpulan Laporan.

Soetjiningsih., & Ranuh,.I.G. (2013) *Tumbuh Kembang Anak* . Jakarta :EGC

Susanto, (2018) Permainan Finger Painting.

WHO. (2018). *World Health Statistic of 2018*. http:aps.who.int diakses tanggal 20 Juli 2021.

Yanti, E & Fridalni, N. (2020). Faktor Yang Mempengaruhi Perkembangan Motorik Anak Usia Prasekolah. Jurnal Kesehatan Medika Saintika. 11(2).

Yumalasari & Apriyanti (2020), Faktor Penentuan Keberhasilan intervensi. Yunus, (2016), Mengembangkan Kecerdasan Kognitif Anak.

THE EFFECT OF BABY LED WEANING METHOD ON ORAL MOTOR SKILLS IN BABIES 6-12 MONTHS IN THE WORKING AREA OF THE EAST PEUREULAK PUSKESMAS

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ABSTRACT

Oral motor skills for babies aged 6-12 months can be improved by providing stimulation such as baby-led weaning, which is a method of eating activities that introduces healthy family foods that are often consumed by families in the form of finger foods and gives children the opportunity to eat on their own from the start of the process of introducing complementary foods. breast milk. The aim of this research was to determine the effect of the baby-led weaning method on oral motor skills in babies 6-12 months in the UPTD Work Area of the East Peureulak Health Center. The research design used in this research is quasi-experimental with a one group pretest-posttest approach. The population in this study were all 127 babies aged 6-12 months in the East Peureulak Health Center Working Area. The number of samples in this study was 15 babies 6-12 months. The sampling technique in this research used purposive sampling. Data analysis was carried out univariate and bivariate using the Wilcoxon test. The results of the study showed that the oral motor skills of babies aged 6-12 months before being given the baby led weaning method were 6.6 with a standard deviation of 0.737 and a Confidence Interval of 5-8 and after being given the baby led weaning method was 7.4 with a standard deviation of 0.516 and Confidence Intervals 7-8. There is an effect of baby-led weaning on oral motor skills in babies 6-12 months with a p-value of 0.004 (p<0.05). It is hoped that parents can use baby-led weaning as an option method for providing MPASI to stimulate children's motor skills, increase children's appetite, train children to recognize food textures, and must still be under the supervision of competent health workers.

Keywords : Baby Led Weaning, Oral Motor Skills, Babies 6-12 Months

INTRODUCTION

Organization (WHO) in 2019, as many as 1.5 million babies died due to inappropriate feeding and 90% of them occurred in developing countries. Underweight in babies occurs because at that age nutritional needs are greater and the age stage is vulnerable to nutrition. The situation of wasting and severe wasting among children under five in the Southeast Asia and Pacific region in 2019 is still far from expectations. Indonesia ranks second highest for the prevalence of wasting among 17 countries in the region, namely 12.1%. In addition, the average case handling coverage in 9 countries in the region only reached 2% (WHO, 2019).

Based on data from basic health research, the number of cases of malnutrition in Indonesia reached 5.7% and undernutrition was 13.9%. The biggest nutritional problem in Indonesia is malnutrition which is mostly caused by consuming food that is not sufficient for the body's needs. Nutritional problems are mainly suffered by children who are growing rapidly, namely the toddler age group whose prevalence is 30-40%. Most nutritional diseases are characterized by body weight below the red line in infancy and childhood, characterized by 2 syndromes, namely kwashiorkor and marasmus (Riskesdas, 2018).

The prevalence of nutritional status for toddlers based on BW/U in Aceh Province is poor nutrition 7.9%, undernutrition 18.4%, good nutrition 70.7%, overnutrition 2.9%. The prevalence of nutritional status based on height for age (TB/U) was very short 20.1%, short 21.4%, normal 58.5%. The prevalence of nutritional status based on body weight and height was very thin 6.1%, thin 9.6%, normal 74.5%, obese 9.8%. Prevalence of nutritional status according to height according to age and weight height short-thin 4.13%, short-normal 31.00%, short-fat 6.16%, normal-thin 11.54%, normal-normal 43.48 %, normal-fat 3.69% (Aceh Health Office, 2020).

Babies have tongue movement and swallowing skills. This skill will help babies in the process of digesting food. When babies consume MP-ASI in the early days, most babies spit food out of their mouths, this is part of the learning process. The eating behavior and eating skills of babies aged 6 months and over must be trained, because the age of 6-9 months is a critical period for the development of baby's eating skills. These eating skills are supported by several basic skills. One of these basic skills is oral motor skills (Muharyani et al, 2018).

Oral motor skills are skills that involve the strength and flexibility of the facial and mouth muscles. These skills are related to visual coordination, movement, as well as coordination of the hands, eyes, facial and mouth muscles which play a role in the process of swallowing and consuming various food textures. Oral motor skills also play an important role in

coordinating basic functions during sleep, such as controlling saliva secretion, swallowing, and maintaining the alignment of the structure of the mouth so that breathing is not disturbed, so that if oral motor skills are hampered it will result in the development of basic daily functions being disrupted, such as being lazy to talk, picky eaters or picky eaters so that they can reduce the nutritional intake needed (Beckman, 2017).

Efforts to improve the oral motor skills of babies aged 6-12 months are by providing stimulation, apart from that, a feeding activity method that is currently being developed is baby led weaning. This baby-led weaning method is a method of eating activities that introduces healthy family foods that are often consumed by the family in the form of finger foods and gives children the opportunity to eat on their own from the start of the process of introducing complementary foods to breast milk. Mothers who apply the baby-led weaning method to their babies have a positive eating experience for both mother and baby and eating becomes more enjoyable (Muharyani et al, 2018).

Another benefit of this method is that the baby enjoys the process of eating, it is relatively easy to invite the baby to eat outside the house when traveling, costs are more economical, the baby develops a healthy eating pattern, the baby participates in family meals and generally eats what the family eats. Apart from that, baby led weaning will also develop better and faster chewing ability, manual dexterity and hand and eye coordination compared to babies who are used to being fed (Rapley & Murkett, 2018).

In line with research conducted by Muharyani et al (2018), which concluded that there was an influence of the baby-led weaning method on oral motor skills with a ρ value of 0.031 and CI before 5.54 to 8.92 while CI after 0.93 to 3.63. The implementation of baby-led weaning can be applied to improve children's oral motor skills as a primary prevention effort in overcoming difficult eating behavior in children.

Based on an initial survey conducted in the UPT work area of the East Peureulak Health Center by observing 10 babies 6-12 months, it was found that 7 (70%) babies had poor oral motor skills, this can be concluded from the mother's statement which said that the baby has an eating behavior that likes to hold food in the mouth for too long, chooses sweet-tasting foods and refuses to eat porridge textures after being given it for about 2 weeks.

Based on the background described above, it is necessary to conduct research on the effect of the baby-led weaning method on oral motor skills in babies 6-12 months in the UPTD Work Area of the East Peureulak Health Center in 2024.

METHODS

The research design used in this research is Quasi Experiment, namely an experiment that does not have or does not have the characteristics of a true

experimental design. The approach chosen is one group pretest-posttest, where in this design there is no comparison group (control) and only conducts research on the case group (intervention) by comparing the results of the first interview (pretest) and testing changes after the experiment (posttest) (Sugiyono , 2016). The research design can be seen in the following table:

Table 1.
One Group Pretest-Postest Design

Pre Test	Treatment	Post Test
O1	*X*	O2

Information :
X: Treatment (baby led weaning)
O1: Pre test (baby's oral motor skills 6-12 months before baby led weaning)
O2: Post test (baby's oral motor skills 6-12 months after baby led weaning)

RESULTS AND DISCUSSION

The results of research conducted on 15 babies in the UPTD Working Area of the East Peureulak Community Health Center which aimed to determine the effect of the baby-led weaning method on oral motor skills in babies 6-12 months old through primary data collection showed the following results:

1. **Baby Characteristics**

Table 2.
Frequency Distribution of Characteristics of Babies 6-12 Months in Regions East Peureulak Community Health Center UPTD work 2024

No	Baby Characteristics	Frequency (f)	Percentage (%)
	Jenis Kelamin		
1	Man	6	40
2	Woman	9	60
	Amount	15	100
	Age		
1	6-9 Month	10	66,7
2	10-12 Month	5	33,3
	Amount	55	100

2. Oral Motor Skills

Table 3.
Oral Motor Skills Of Babies 6-12 Months In The Region
Uptd Job For East Peureulak Community Health Center 2024

No	Oral Motor Skills	N	Mean	SD	Min-Max CI 95%
1	Before *Baby Led Weaning*	15	6,6	0,737	5-8
2	After *Baby Led Weaning*		7,4	0,516	7-8

Bivariate Analysis Results Using Non-Parametric Tests (Wilcoxon Test) Obtained The Following Results:

Table 4.
The Effect of the Baby Led Weaning Method on Skills
Oral Motor in Babies 6-12 Months in Work Areas
UPTD East Peureulak Health Center 2024

No	Oral Motor Skills	N	Mean Rank	Z-Test Z-Count	Z-Table	*p-value*
1	Negative Rank	0				
2	Positive Rank	10				
3	Ties	5	5,5	-2.919[b]	3,264	0,004
	Amount	**15**				

The results showed that of the 15 babies aged 6-12 months who were given the baby led weaning method, 10 babies experienced an increase in their oral motor skills, no babies experienced a decrease in their oral motor skills and 5 babies experienced no change in their oral motor skills. The results of the Wilcoxon test show a p-value of 0.004 (p<0.05) where Z-count (2.919) < Z-table (3.264) so it can be concluded that there is an influence of baby-led weaning on oral motor skills in babies 6-12 months.

DISCUSSION

The results of the study showed that the oral motor skills of babies aged 6-12 months before being given the baby-led weaning method were 6.6 with a standard deviation of 0.737 and a confidence interval of 5-8. This research is in line with that conducted by Maharyani et al (2018) regarding the influence of the baby lead wining method on oral motor skills in babies (6-12 months) at Sesa Sidorejo UPTD Way Hitam Health Center IV. The research results

showed that the baby's oral motor skills before implementing baby-led weaning had a mean value of 7.2381 and a standard deviation value of 3.71.

Babies actually have tongue movement and swallowing skills. These two skills will determine when your baby gets his first solid food. In the early months, babies have a "tongue rejection" reflex which causes the tongue to automatically stick out when something enters the mouth. This is a movement to protect the various solid foods that will be given. When a baby reaches 6 months of age, this reflex to reject solid food decreases. Another sign that is a signal that the baby does not need to be given solid food before 6 months is the absence of teeth before the age of 6 or 7 months. In this way, it can be concluded that at the age of 0 to 6 months, babies eat by sucking, not chewing (Maelani et al, 2021).

Strength and flexibility of facial and oral muscles are components of oral motor skills. Speaking, swallowing, and swallowing various textures of food all rely heavily on the movement and synchronization of facial and oral muscle structures. Coordinating basic sleep tasks such as swallowing, regulating saliva production, and maintaining the alignment of oral structures to prevent respiratory disorders are all made possible by oral motor abilities. The development of basic functions will be disrupted if oral motor skills are impaired. Children with poor oral motor skills are usually characterized as hypersensitive, reluctant to communicate, or fussy eaters (Sari et al, 2024).
Researchers assume that before implementing the baby-led weaning method, most of the babies in this study liked to keep food in their mouths for too long, chose sweet foods, and rejected foods with hard textures. The behavior of spitting food out of the mouth, chewing for a long time, liking to brush the mother's mouth, and being picky about food when eating are difficult eating behaviors. Picky eating behavior is often caused by impaired oral motor skills in children. Therefore, preventive efforts such as implementing baby led weaning are very necessary to overcome the problem of feeding children due to impaired oral motor development in children.

Oral Motor Skills After Being Given the Baby Led Weaning Method to Babies 6-12 Months. The results of the study showed that babies who had been given the baby led weaning method were 7.4 with a standard deviation of 0.516 and a confidence interval of 7-8. This research is in line with research conducted by Maharyani et al (2018) regarding the influence of the baby lead wining method on oral motor skills in babies (6-12 months) at Sesa Sidorejo UPTD Way Hitam Health Center IV. The results showed that the baby's oral motor skills before implementing baby led weaning had a mean value of 2.2857 and a standard deviation value of 2.96

Giving children the freedom to choose and eat food with their own hands is known as baby-led weaning, which is a technique for preventing MPASI. This approach seeks to engage children's motor skills, increase children's hunger, and teach them to detect food texture by allowing them the freedom to choose the food they want, hold it, and learn how to chew. A child must be

able to sit upright for weaning to occur, and the baby must be at least 6 months old. Food prepared for weaning must be soft food, such as finger food (Dewi et al, 2023).

One type of sensory stimulation that can be used to reduce oral hypersensitivity, strengthen and expand the range of motion of the sucking muscles, and trigger reflexes that help the sucking process is oral stimulation. This oral stimulation program consists of 15 minutes daily for seven days to stimulate intraoral tissues such as the molars, inner cheeks, tongue, and palate, as well as perioral structures including the cheeks, jaw, and lips through stroking movements. Because they have a strong sucking reflex, babies can drink breast milk according to their needs to meet their nutritional needs and are expected to grow and develop according to their age (Apriluana and Fikawati, 2018)

Researchers assume that there is an increase in oral motor skills in babies aged 6-12 months after implementing the baby-led weaning method. With this method, there will be an opportunity for children to learn to eat on their own which will develop coordination and stabilization of the oral motor muscles so that it can influence the child's ability to process food and the child can eat well and nutritiously and not like to pick at food. This will influence the child's growth and development optimally.

The results of the Wilcoxon test show a p-value of 0.004 (p<0.05) where Z-count (2.919) < Z-table (3.264) so it can be concluded that there is an influence of Baby Led Weaning on oral motor skills in babies 6-12 months . The results of the study also showed that of the 15 babies aged 6-12 months who were given the Baby Led Weaning method, 10 babies experienced an increase in their oral motor skills, no babies experienced a decrease in their oral motor skills and 5 babies experienced no change in their oral motor skills.

This research is also in line with that conducted by Sari et al (2024) regarding the effect of the baby-led weaning method on oral motor skills in babies (6-12 months) at the Pratama Tanjung Clinic, Deli Tua District. The results of the study showed that providing the baby lad weaning method had an influence on the oral motor skills of babies aged 6-12 months at the Pratama Tanjung Clinic with a p-value of 0.001 < 0.05.

A feeding technique called "baby led weaning" teaches babies to identify the taste, texture and shape of food. Children's oral motor development is also influenced by the taste and texture of food. The coordination of babies' sensory and motor systems also develops as they experiment with different textures, tastes, shapes and sizes of baby foods. The baby's hands and eyes work together to place the baby in the mouth, demonstrating the coordination of his motor and sensory systems. So that the oral motor muscles can move steadily and coordinate with each other to produce oral motor patterns, this coordination will encourage the activity of these muscles (Maelani et al, 2021).

Eating becomes more enjoyable for mothers who use the baby-led weaning method with their babies, because both parties get good eating results. For example, newborns learn healthy eating habits, they enjoy eating, it's easy to get them to eat when traveling, and they usually join in on family dinners. In addition, compared to newborn babies who are used to being breastfed, baby led weaning will encourage the development of chewing ability, motor dexterity, and better and faster hand-eye coordination (Judarwanto, 2018).

Researchers assume that with baby-led weaning, babies will learn to process food by instinct, such as when a baby holds an object and learns about the object by putting it in its mouth and learning to chew it. The feeding method that has been used by mothers in the UPTD Work Area of the East Peureulak Community Health Center is by feeding the child (conventional MPASI). However, some children refuse to give conventional MPASI, resulting in the child's weight loss, so it is necessary to implement the baby-led weaning method. The application of the baby-led weaning method that has been carried out by respondents shows that there is an increase in oral motor skills, where they can learn to recognize the shape, taste and texture of food so that they can increase appetite and can stimulate oral motor skills which helps the baby's growth.

ACKNOWLEDGEMENT

REFERENCES

Apriluana, G. and Fikawati, S. (2018) 'Analysis of Risk Factors for Stunting Incidence in Toddlers (0-59 Months) in Developing Countries and Southeast Asia', Health Research and Development Media, 28(4), pp. 247–256.

Arsad, N., Adityaningrum, A. and Mahdang, PA (2023) 'Relationship between giving breast milk, colostrum and mpasi with the nutritional status of toddlers', Jambura Journal of Epidemiology, 3(1), pp. 18–26.

Beckman, D. (2017) 'What areas are affected by poor oral motor skills?' Available at: https://www.beckmanoralmotor.com/.

Dewi, AVN et al. (2023) 'Counselling the Baby Led Weaning Method to Improve the Knowledge of Mothers of 6-24 Month Old Babies', JMM (Jurnal Masyarakat Mandiri), 7(2), p. 1459.

Aceh Health Office (2020) 'Aceh Health Profile'. Banda Aceh: Aceh Health Office.

Judarwanto, W. (2018) Overcoming Eating Difficulties in Children. Jakarta: Puspa Swara.

Maelani, M., Pertiwi, S. and Wulandara, Q. (2021) 'The Effect of Providing MP-ASI Using the BLW (Baby Led Weaning) Method on Picky Eater Behavior in Toddlers Aged 12-24 Months in RW 015 and RW 016, Kahuripan Village, Tawang District, Tasikmalaya City in 2020', Journal of Midwifery Information (JoMI), 1(2), pp. 83–90.

Muharyani, PW, Jaji and Nurhayati, E. (2018) 'The Effect of Baby Lead Winning Method on Oral Motor Skills in Infants (6-12 months) at Sesa Sidorejo UPTD Way Hitam IV Health Center', Community Nursing Journal, 2(1), pp. 32–38.

Rapley and Murkett (2018) Baby Led Weaning Helps Your Baby Love the Right Foods. Jakarta: PT Elex Media Komputindo.

Riskesdas (2018) 'National Report of Riskesdas 2018'. Available at: http://litbag.depkes.go.id/.

Rukiyah, AY and Yulianti, L. (2019) The Concept of Midwifery. Jakarta: Trans Info Media.

Sanusi, A. (2018) Quantitative and Qualitative Research Methodology. Jakarta: Salemba Empat.

Sinaga, HT, Siregar, M. and Simanullang, RH (2020) 'Literature Review: Factors Causing Low Coverage of Early Breastfeeding Initiation (IMD) and Exclusive Breastfeeding', Jurnal Kebidanan [Preprint].

Sugiyono (2016) Quantitative, Qualitative and R&D Research Methods. Bandung: Alfabeta.

Wardani, ERP. (2019) The Effect of Providing Complementary Food Using the Baby Led Weaning (BLW) Method on the Development of Fine Motor Skills in Children Aged 6-9 Months in Sumberadi Mlati Village, Sleman in 2019. Bethesda Yakkum Health College, Yogyakarta.

WHO (2019) 'Global Breastfeeding Scorecard'. Word Health Organization.

APPENDIX
(if any)

THE INFLUENCE OF ENVIRONMENT AND FAMILY COMMUNICATION PATTERNS ON THE OCCURRENCE OF SPEECH DELAY IN CHILDREN IN GAMPONG LAMBAROANGAN, DARUSSALAM DISTRICT, ACEH BESAR REGENCY

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ABSTRACT

The family environment is very influential on the development of children's speech. Early childhood speech delay requires special treatment and more attention from families, especially parents, in order to improve children's language development, so that children are able to communicate well in the family and community environment. The existence of interaction activities between family members, especially for children aged 3-5 years through communication patterns and stimuli, will determine the basis for providing speaking skills to children. This study uses quantitative with purposive sampling method, namely sampling with certain criteria or considerations. Where researchers want to know the relationship between the variables studied, namely the influence of the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency. The population of this study were children who experienced speech delay with a sample of 60 people obtained from observations through Puskesmas and Posyandu activities. Through this sample, 72.1% of fathers were found to be early adults with 61.0% secondary education level and had 32.0% occupation as traders, while 82.2% of mothers were early adults with 64.7% secondary education level and only 40.3% as housewives. Also through the results of the study obtained a significance value smaller than 0.05 (0.000 <0.05) and a correlation coefficient value of 0.632. Based on the results of the data obtained from the analysis conducted, it can be concluded that there is a significant influence between the environment and family communication patterns on the occurrence of speech delay in children in

Gampong Lambaroangan, Darussalam District, Aceh Besar Regency.

Keywords: Environment, Communication Patterns, Family, Child Speech Delay

INTRODUCTION

Childhood is an important period for learning language, if the introduction of language is not done before adolescence, the child will experience a lifetime of inability to use good grammar. For this reason, the introduction of words and sentences to children from an early age can help children to acquire better language and speaking skills (Fatimah et al, 2024). Early childhood education is education provided to children aged 0-6 years. This age is a critical period in developing the basis of thinking, behavior and emotional well-being of children (Bakken, Brown, & Downing, 2017). This period is also the easiest to receive stimulation. So that the role of parents, family members and the environment is needed in providing stimulation of child development, one of which is language development (Hasanah & Sugito, 2020).

The use of vocabulary and children's language skills depend on the experiences children have in the family and environment. Families, especially parents, play a very large role in helping children's speech and language development, namely through stories, guessing, word games, singing, reading books together (Kurniasari & Sunarti, 2019). The age of 2.5 years to 5 years is the most peak and rapid age in language development compared to toddlers. Language skills in children are considered a measure of normal child development (Sunderajan & Kanhere, 2019).

The communication pattern carried out in the family should be a two-way communication because this communication pattern will directly provide opportunities for children to express their opinions and/or for toddler age children this will help train them to speak (Silviana et al, 2021). However, if the communication is only one-way (from parents), it is difficult for children to practice speaking or develop their language skills. In developing communication to children, parents have an important role in doing so, such as maternal demographics consisting of high education, a mother will find it easier to develop verbal to children (Savitri et al, 2024).

Delay in speaking or what is commonly referred to as speech delay can be classified as a speech barrier. Obstacles are a form of difficulty for someone in achieving a goal (Hutami & Samsidar, 2028). There are many possible factors that cause children to experience delays in speech, such as: lack of parental ability to create communication relationships with children, poor community environment factors that

result in children not being allowed to play outside the home, the influence of television and gadget viewing, and the factor of parents' busy daily lives so that children spend their time playing alone (Ulya, 2024).

Language delays in children are caused by lack of stimulation from parents towards children who are not good, causing disruption to the child's growth and development process. As a result, children will have difficulty in adjusting and socializing with the surrounding environment, so that children will withdraw from the environment (Fauzia et al, 2020). The danger will affect the ability to communicate with the environment and have an impact on academic learning ability. With effective child speech communication, children will be able to convey their wishes, hopes, and requests (Kurniasari & Sunarti, 2019).

Language development in children aged 3-5 years is found to experience many obstacles, in the form of articulation disorders, words or vocabulary, sound production. Lack of stimulation of parental communication with children, usually due to parents who are too busy working and do not have time to communicate effectively with their children (Purnomo et al, 2023). The percentage of children in Indonesia who live with biological parents is 87.5%. This indicates that most children in Indonesia still get care from both parents. However, not all families have the strength to help children grow and develop properly, some families have demographic status problems such as education, employment, and lack of income, so that these things can support the inhibition of child development including communication (Syahrizal, 2023).

Furthermore, in a study written by Aini (2022) stated that the results of the study had shown that there were 11 factors influencing speech delay that occurred in the case subject, namely the concept of multilingual (Multilingual), models that are not good enough to imitate, lack of opportunities to practice speaking, lack of motivation to speak, guidance, encouragement, peer relationships, self-adjustment, classification in sex roles, gender, and family size. In addition, there are also 3 factors found in this study, namely the factor of children's habits in watching television or gadjet, the sibling system, and the knowledge of people around the subject who do not understand these obstacles (Aulia, et al, 2023).

Through the family, children are guided to develop their abilities and creativity. Parents usually have various ways and strategies to communicate and educate the most important informal for education, so communication patterns in the family will affect the process of growth and development of children. Therefore, the interaction between parents and children through family communication patterns determines the basis of children's provision including children's speaking skills.

(Merdekawati, 2018). Family communication patterns are communications that occur in families where the source is parents to their children or children to parents who have certain patterns. The results of the study concluded that family communication patterns have a positive effect on child development in physical, emotional, cognitive, psychosocial and language. Thus, family communication patterns are very important in supporting children's language development including children's speaking skills (Wiranata & Tsuroyya, 2024).

The results of the initial study of researchers conducted at Posyandu Gampong Lambaro Angan to several mothers who have children with verbal development disorders, stated that they had to leave children because of work, then lack of interaction at home and also due to low parental education so that they did not know the causes or signs of children experiencing language development disorders. Children's development needs to be honed and developed rapidly through early stimulation that can be given directly by parents, other family members, or when interacting with other people when outside the home. The stimulation provided will relate to aspects of language development and children's independence. Based on the description above, the author feels the need to conduct research on the influence of the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency.

METHODS

This type of research is quantitative, where researchers want to know the relationship between the variables studied, namely the influence of the environment and parental communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan. This research will be conducted in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency and carried out in September 2024. The things that were done were researchers met parents during Posyandu activities. Researchers asked parents, especially mothers to fill out a research questionnaire while providing guidance on how to fill out the questionnaire.

This study uses purposive sampling technique, namely sampling with certain criteria or considerations. The criteria used by the sample in this study are: (1) children aged 3-5 years who experience speech delay (2) parents (father/mother/guardian) who have children with speech delay problems and live in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency. According to information from the Darussalam District Health Center officer during Posyandu activities, the coverage of visits by children aged 3 - 5 years each year is

316 children and for verbal development in 2023 for toddlers as many as 42% still experience problems such as communication delays even though the child's age has reached 5 years. The population of this study were children who experienced speech delay with a sample of 60 people obtained from observations through Puskesmas and Posyandu activities. The data in this study were obtained from a questionnaire on family communication patterns and a test of children's speaking skills.

The instrument is made closed, namely the statement is presented in such a form that the respondent just gives a check list (√) in the appropriate column or place, with a direct questionnaire using a multilevel scale. Suggests alternative answer choices consisting of only four choices, namely Very Suitable (SS), Suitable (S), Less Suitable (KS) and Very Unsuitable (STS). Each answer is associated with a numerical value. The data obtained from this research is continued by analyzing the data and then drawing conclusions using parametric statistics. The statistical analysis technique used to test the hypothesis in this study is Product Moment Correlation Analysis (Arikunto 2010: 317).

RESULTS AND DISCUSSION

This study was conducted on 60 respondents with the title of the influence of the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency. Based on the research, the following results were obtained:

Research Results

The characteristics of the respondents in this study are shown in table 1:

Table 1. Characteristics of Respondents (n=60).

No	Characteristics	f	%
	Age of Father		
1	Young Adult	42	72.1
2	Middle Adult	18	27.9
	Mother's Age		
1	Young Adult (20-35 years)	51	82.2
2	Middle Adult (36-45 years)	9	17.8
	Father's Education		
1	Higher	20	30.1
2	Intermediate	35	61.0
3	Elementary	5	8.9
	Mother's Education		
1	Higher	28	29.5

2	Intermediate	38	64.7
3	Elementary	2	5.8
Father's Occupation			
1	Civil servant	4	8.3
2	Contract	9	13.2
3	Private	17	28.8
4	Trader	20	32.0
5	Handyman	8	11.5
6	Fisherman	2	6.2
Mother's Occupation			
1	Civil servant	10	8.5
2	Private	11	23.0
3	Trader	17	28.2
4	HOUSEWIFE	22	40.3
Family Income			
1	High	14	15.8
2	Medium	35	67.3
3	Low	11	16.9

Table 1. illustrates that the largest number and percentage of the 60 families of children under five were 42 (72.1%) fathers of early adulthood, 51 (82.2%) mothers of early adulthood, 35 (61.0%) fathers with secondary education, 38 (64.7%) mothers with secondary education, 20 (32.0%) fathers worked as traders, 22 (40.3%) mothers as housewives, 14 families (15.8%) had a high income level and 35 families (67.3%) had a medium income.

Testing the requirements of analysis using normality test and linearity test. The results of the normality test calculation for all variables are presented in table 2:

Table 2. Summary of Normality Test Results

Variable	Sig (p)	Description
Environment family	0,541	Significance > 0,05 = normal
Communication patterns family	0,513	Significance > 0,05 = normal

From the calculation of the normality of the data distribution of environmental variables and family communication patterns on speech delay in children in this study is normally distributed, because it has a significance value greater than 0.05 at (p>0.05).

The results of the linearity test on environmental variables and family communication patterns on the occurrence of children's speech delay are presented in table 3:

Table 3. Linearity Test Results

Correlation	F count	Sig (p)	Description
X.Y	1,516	0,148	Linier

The results of the linearity test above, it can be seen that the significance value is greater than 0.05 (0.148 > 0.05), this indicates that all research variables are linear.

Data analysis used to test the hypothesis in this study is product moment correlation analysis. The hypothesis in this study is "there is a significant influence between the environment and family communication patterns on speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency".

The results of the product moment correlation test are presented in table 4:

Table 4. Influence of environment and family communication patterns on the occurrence of speech delay in children

Variable	r count	p sig.	Description
X.Y	0,632	0,000	Significance

Based on table 4, it can be seen that the results of the analysis with the product moment correlation test for the influence of the environment and family communication patterns on the occurrence of speech delay in children obtained a probability of 0.000. Because the probability of significance of the resulting research is less than 0.05 (p < 0.05), it means that the correlation coefficient is significant. So the alternative hypothesis (Ha) which reads "there is a significant influence between the environment and family communication patterns on speech delay in children in Gampong Lambaroangan, Darussalam

District, Aceh Besar Regency", is accepted.

Discussion

The results of the study in table 1 conclude that "there is a significant influence between the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency" with the level of parental education. This was obtained from the educational background of parents of children aged 3 - 5 years in this study, namely 61.0% of fathers with secondary education and 64.7% of mothers also with secondary education. Wallace et al. (2015) stated the same thing, namely risk factors associated with speech and language delays are male gender, family history and low parental education.

Based on this table, it can be explained in detail that the causes of speech delay in children. First, parents are busy, which causes a lack of attention and involvement of parents in children's speech development. Though parents have a very important role in the development of children because parents become the first person where children communicate. Second, the low level of education of parents causes a lack of knowledge to facilitate and stimulate children's speech development. Research conducted by (Hartanto, Selina, H, & Fitra, 2016) found that a mother's low education has a high possibility for children to experience speech delays due to the lack of stimulation obtained by children in the closest environment, namely parents.

Parents also essentially have a role as the child's first language teacher and have the right opportunity to facilitate children's language development (Siregar & Hazizah, 2019). Third, the lack of stimulation, positive environmental support and interaction between the child and family during the developmental period causes speech delay (Fitriyani et al., 2019). A child with speech delay uses words or phrases to express their ideas but is difficult for others to understand. Thus, people around the child will tend to avoid conversations with the child.

The results of this study also show that there is a positive and significant influence between the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency. This is evidenced by a significance value smaller

than 0.05 (0.000<0.05) and a correlation coefficient of 0.632. This means that the strength of the influence of the environment and family communication patterns on speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency includes a strong correlation. The results of this study strengthen the results of previous research conducted by Kurniasari & Sunarti, 2019 which states that the use of vocabulary and children's proficiency in language depends on the experiences children get in the family and environment. Thus, the environment and family communication patterns are very important in supporting children's language development including children's speaking skills.

Parents' parenting skills significantly impact children's language growth and development in life. Negative experiences that children get in childhood will provide long-term challenges to children's further development, including experiences that children get in the family for parental care (A'yun & Masykur, 2019). This study also corroborates Hurlock's (1980) opinion that one of the factors that influence how much children speak is the family. The family is one of the most important informal education places for children's education, so the environment and communication patterns in the family will affect the process of growth and development of children, so that it becomes the basis for equipping children's speaking skills.

Based on the description previously stated, it can be concluded that there is a positive and significant influence between the environment and family communication patterns on speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency. The better the influence of the environment and family communication patterns on a child, the better the word and language patterns will increase, so as to prevent speech delay in children. Therefore, families, especially parents, need to provide a good social environment and choose effective family communication patterns for children, so that they can support children's speaking skills.

CONCLUSION

Based on the data obtained from the results of the analysis conducted, it was found that the education level of the father (61.0%) and mother (40.3%) was relatively secondary

education, and also the father (32.0%) and mother (28.2%) both had jobs as traders. Meanwhile, through the data, the significance value is smaller than 0.05 (0.000 <0.05) and the correlation coefficient value is 0.632. So this means that there is an influence of the environment and family communication patterns on the occurrence of speech delay in children in Gampong Lambaroangan, Darussalam District, Aceh Besar Regency.

ACKNOWLEDGMENTS

REFERENCES

A'yun, W. Q. N., & Masykur, A. M. (2019). The Relationship Between the Perception of Authoritarian Parenting With Bullying Intentions in Psychology Students of 2018 Diponegoro University, 7(4), 80–84.

Aini, Qurotul, Alifia, P. (2022). Speech Delay Disorder in 6-Year-Old Children in RA An-Nuur Subang. Vol 1 No 1 (n.d.): 8-17.

Aulia, F., Ain, H., & Pujiastuti, N. (2023). Factors Affecting Speech Delay In Toddlers. Journal of Nursing Science Update Vol. 11, No. 1, e-ISSN: 2829-0003 DOI : p-ISSN: 2829-7075. 10-15.

Arikunto, S (2010). Research Procedures and a Practical Approach. Jakarta: Rineka Cipta.

Bakken, L., Brown, N., & Downing, B. (2017). Early Childhood Education: The Long-Term Benefits. Journal of Research in Childhood Education.

Fauzia, W., Meiliawati, F., & Ramanda, P. (2020). Recognizing and Managing Speech Delay in Children. Al-Shifa Journal. Vol. 1, No. 2. 102-108.

Fatimah, F. N., Hermina, C., & Fikrie. (2024). Overview of the Quality of Parent-Child Relationships in Parents Who Have Speech Delayed Children. Journal of Psychology. Vol. 1, No. 4, 2024, Banjarmasin. 3 -16.

Fitriyani, F., Sumantri, M. S., & Supena, A. (2019). Language Development and Social Emotions In Children With Speech elay: Case Study Of 9 Year Olds In Elementary School. Journal of

Counseling and Education. 3-10.

Hasanah, N & Sugito. (2020). Analysis of Parenting Patterns on Speech Delay in Early Childhood. Journal of Early Childhood Education. Vol. 4. ISSN: 2549-8959: Yogjakarta. 914-919.

Hartanto, F., Selina, H., Zuhriah, H., & Fitra, S. (2016). The Influence Of Language Development On Cognitive Development Of Children Aged 1-3 Years. Journal Of Psychology Sari Pediatri, 12(6), 386-390.

Hurlock, E.B. (1980). Developmental Psychology. Jakarta: Erlangga. 115.

Hutami, E. P., & Samsidar. (2018). Symbolic Communication Strategy of Speech Delay in 6 Years Old Children at Paramata Bunda Kindergarten Palopo. Tunas Cendekia Journal. ISSN 2622-0849. Vo. 1, Ed. 1. 40-42.

Kurniasari, L., & Sunarti, S. (2019). Early Detection Of Speech Delay And Family Factors. Journal Of Public Health In Africa, 10(s1), 152–153.

Purnomo, Y. I., Romli, L. Y., & Nofalia, I., (2023). The Relationship between Parental Communication Patterns and the Risk of Language Development Delay in Pre-school Age Children (In Paud/Ra Babussalam Kemuning, Tarik District, Sidoarjo Regency). Research Procedures, a Practical Approach. Jakarta: Rineka Cipta.

Savitri, N. P. S. P., Primatanti, P. A., & Riandra P. I. K. (2024). Risk Factors Associated with the Occurrence of Speech Delay in Children. Journal of Public Health. Vol. 8, No. 2, ISSN 2623-1581. 3305-3306.

Silviana, M., Tahlil. T., & Mutiawati, E. R. (2021). Factors Associated With Impaired Verbal Development of 5-Year-Old Children in Banda Aceh City. Journal of Science and Applications. Vol. IX, No. 2, pISSN 2337 – 9952, eISSN 2656 – 844. 126-128.

Siregar, A. O., & Hazizah, N. (2019). A Case Study of 6-Year-Old Children's Speech Delay in Kindergarten. Aulad : Journal on Early Childhood, 2(2), 22–27.

Sunderajan, T., & Kanhere, S, V. (2019). Speech And Language Delay In Children: Prevalence And Risk Factors. Journal of Family Medicine and Primary Care, 8(5), 1642– 1646.

Syahrizal, H,. Nurhafizah, Wahyuningtyas, I. P. (2023). Effects of Parental Treatment and Parenting on the Social Development of Early Childhood Late Talkers. Jambi, Journal Of Disability Studies And Research (JDSR), 2(2). 62-63.

Ulya, F. (2024). Environmental Response to Speech Delay Children at

Dharma Wanita Nailan Kindergarten. Rosyada: Islamic Guidance and Counseling Vol. 5 No. 1.

Wallace, I. F., Berkman, N. D., Watson, L. R., Coyne-Beasley, T., Wood, C. T., Cullen, K., & Lohr, K. N. (2015). Screening For Speech And Language Delay In Children 5 Years Old And Younger: A Systematic Review. Pediatrics, 136(2), 448 – 462.

Wiranata, I. P. R., & Tsuroyya. (2024). Communication Patterns of Parents in Handling Speaking Skills in Children with Speech Delay. Jurnal Commercium. Vol. 8 No. 1. 109 – 11

THE RELATIONSHIP BETWEEN LONG-SUFFERING FROM HYPERTENSION WITH THE LEVEL OF ANXIETY IN ELDERLY PEOPLE AT THE COMMUNITY HEALTH CENTER ACEH BESAR REGENCY, INDONESIA

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ABSTRACT

Hypertension or high blood pressure is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg so it is often referred to *as the silent killer* because it does not show significant symptoms. Hypertension is one of the main causes heart disease and stroke. Every year, hypertension is the cause of death in the figure of 9.4 million people is caused by heart disease and stroke, and if combined, heart disease and stroke are causes of deadly diseases number one in the world. The purpose of this study is to find out if there is a correlation between the length of time suffering from hypertension and the level of anxiety of elderly patients. The type of research used was a quantitative study on 58 respondents at the Community Health Center Aceh Besar Regency using a *cross sectional study* design with a sampling technique, namely *convenience sampling*. Data collection used the *Hamilton Anxiety Rating Scale* (HARS) questionnaire which was analyzed using Kendall Tau Test. The value between the duration of suffering from hypertension and the level of anxiety is known amounting to 0.417 with a significant value of 0.000 (< 0.05). The results obtained were that most of the patients with moderate hypertension with a BP of 160-180 mmHg were 28 respondents, 24 respondents had hypertension > 11 years, and 31 respondents had mild anxiety levels. *The chi-square* value between the length of time suffering from hypertension and the level of anxiety was $p = 0.000$. The conclusion of this study is that there is a relationship between the length of suffering from hypertension and the level of anxiety in the elderly.

Keywords: Hypertension, Suffering from Hypertension, Anxiety.

INTRODUCTION

Non-communicable diseases (NCDs) are the leading cause of death globally. One of the diseases that is a serious problem is high blood pressure (hypertension). Hypertension is an increase in blood pressure in the arteries where the systole pressure is equal to or equal to 140 mmHg or the diastol pressure is greater than or equal to 90 mmHg. Hypertension is often referred to as *the silent killer* because it does not show significant symptoms (Ministry of Health of the Republic of Indonesia, 2018).

According to *the World Health Organization* (2019) the prevalence of hypertension varies across regions and also by country income group. The African region has the highest prevalence of hypertension at 27%, while the American region has the lowest prevalence of hypertension at 18%. A current trend review shows that the number of adults with hypertension increased from 594 million in 1975 to 1.13 billion through 2015, with the increase mostly seen in low- and middle-income countries. In addition, the prevalence of hypertension in the world according to the World Health Organization (2022) increased by 22% of the world's total population. Meanwhile, in Indonesia, hypertension cases have increased by 8.31%, from 25.8% in 2013 to 34.11% in 2018.

An unhealthy lifestyle can also cause hypertension, namely with an unhealthy diet such as consuming foods that are high in fat or cholesterol such as: fried foods, foods with coconut milk, satay, and curry (Cumayunaro & Dephinto, 2018). The increasing prevalence of hypertension from year to year is due to the increasing population, lack of physical activity and an unhealthy lifestyle.

Basic Health Research Data in 2018, stated that out of a total of 1.7 million deaths in Indonesia, the risk factor that causes death is hypertension at 23.7%. The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218 deaths (Ministry of Health of the Republic of Indonesia, 2018).

The World Health Organization (WHO) (2017) states that depression and anxiety are common mental disorders with the highest prevalence, more than 200 million people around the world suffer from anxiety. Based on data from the Ministry of Health (2021), as many as 18,373 people experience anxiety disorders, this figure has increased by 6.8% of the total population of Indonesia and more than 23,000 are depressed.

One of the problems that is commonly experienced by everyone is anxiety. Anxiety is a reaction of excessive anxiety or fear accompanied by strong emotions about something that is considered life-threatening. A common reaction to illness due to illness is considered a threat to life, health, and the integrity of the body (Antoro & Amatiria, 2018).

Anxiety can be defined as a disorder of the nature of feelings characterized by deep and persistent feelings of fear or worry, not experiencing disturbances in assessing reality, the personality still intact or

not experiencing normal personality cracks. Mental stress or anxiety is caused by excessive concern for the problems that are being faced real or imagined may occur. The most common anxiety is caused by illness, one of which is hypertension. So it is necessary to prevent it early so that hypertension does not cause new problems for patients. This is what makes patients and their families anxious about the patient's condition (Hawari, 2013).

METHODS

This study is a quantitative research with descriptive correlational where the researcher examines the relationship between two variables and aims to reveal the correlative relationship between variables using a *cross sectional study* design. The population in this study is all elderly patients who experience anxiety at the Community Health Center Aceh Besar Regency, Indonesia. The sample in this study is elderly patients who experience anxiety with hypertension totaling 58 patients. In this study, the *convenience sampling* technique is used, which is to select samples based on the time and place encountered by the researcher and included in the sample criteria. In this study, data collection was carried out using the *Hamilton Anxiety Rating Scale* (HARS) questionnaire to assess anxiety symptoms experienced in the elderly with hypertension.

RESULTS AND DISCUSSION

1. Univariate Analysis

Table 1. Frequency of Gender of Hypertensive Patients in the Elderly

No	Gender	Frequency	Percentage
1	Female	41	70,7
2	Male	17	29,3
	TOTAL	58	100

From the results of the study in table 1, it can be seen that the most respondents who visited the health center were elderly patients with a female gender as many as 41 people (70.7%). So, female are currently more dominant in experiencing hypertension, this is because if female enter menopause, the risk of hypertension increases so that the prevalence is higher than male. This is caused by the production of the hormone estrogen decreasing during menopause, causing an increase in blood pressure (Artiyaningrum, 2016).

Table 2. Distribution of Blood Pressure Frequency in the Elderly

No	Blood pressure	Frequency	Percentage
1	Moderate Hypertension	28	48,3
2	Mild Hypertension	26	44,8
3	Severe Hypertension	4	6,9
	TOTAL	58	100

From the results of the study in table 2, it can be seen that the elderly who visited the health center obtained data on patients experiencing moderate hypertension (160-180 mmHg) as many as 28 people with (48.3%). This is due to the general population of adults aged 60 years or older and at this time pharmacological treatment should be started when the systolic blood pressure is 150 mmHg or when the diastolic blood pressure is around 90 mmHg or more (Diartin, Zulfitri & Erwin, 2021).

Table 3. Distribution of Long-Suffering from Hypertension in the Elderly

No	Long-Suffering	Frequency	Percentage
1	> 11 years	24	41,4
2	6-10 years	19	32,8
3	1-5 years	15	25,9
	TOTAL	58	100

From the results of the study in table 3, it can be seen that the elderly who visited the health center obtained data on patients with hypertension > 11 years as many as 24 people (41.4%). This shows that increasing age affects the occurrence of hypertension so that the risk of developing the disease becomes greater. Blood pressure in the elderly (elderly) will tend to be high so that older people are at risk of hypertension (high blood pressure). Increasing age causes blood pressure to increase, because the walls of the arteries in the elderly will experience thickening which results in the accumulation of collagen substances in the muscle layer, so that blood vessels will gradually narrow and become stiff (Anggraini, 2014).

Table 4. Distribution of Anxiety Levels of Hypertensive Patients in the Elderly

No	Anxiety Level	Frequency	Percentage
1	Mild Anxiety	31	53,4
2	Moderate Anxiety	16	27,6
3	No anxiety	11	19,0
	TOTAL	58	100

From the results of the study in table 3, it can be seen that the majority of elderly people with hypertension experience mild anxiety by 31 people (53.4%). In this case, anxiety can cause various negative effects on the body, such as an abnormal heartbeat (arrhythmia), increased blood pressure, increased cardiac output, as well as a faster heartbeat. This condition, if not managed properly, can lead to serious complications in patients, including an increased risk of coronary heart disease (Sari, Rohmawati, Faizah, Hasina, & Putri, 2023).

2. Bivariate Analysis

Table 5. The Relationship Between Long Suffering From Hypertension And The Anxiety Level Of Hypertensive Patients In The Elderly

Variable	Anxiety Level								p-value
	No anxiety		Mild anxiety		Moderate anxiety		Total		
	f	%	f	%	f	%	f	%	
Long-Suffering from Hypertension a. > 11 years b. 6-5 years c. 1-5 years	2 3 6	3,4 5,2 10,3	10 13 8	17,2 22,4 13,8	12 3 1	20,7 5,2 1,7	24 19 15	41,4 32,8 25,9	0,000
TOTAL	11	19,0	31	53,4	16	27,6	58	100	

Based on table 4, it can be seen that the longest suffering from hypertension in the elderly is in the category > 11 years, namely 24 people (41.4%) with the highest level of moderate anxiety, namely 12 people (20.7%), while the lowest is 2 people (3.4%) with no anxiety. The data showed a significant value of 0.000 (< 0.05) which can be interpreted that there is a relationship between the length of suffering from hypertension and the level of anxiety in hypertension patients at the Community Health Center Aceh Besar Regency, Indonesia.

Discussions

Based on the results of the above study, it can be seen that 58 respondents on average experienced anxiety with the highest long-term category of suffering from hypertension, namely > 11 years old, looking to have suffered from hypertension for a long time in the elderly with the most in the > 11-year-old category, namely 24 people (41.4%) with the highest level of moderate anxiety, namely 12 people (20.7%), while the lowest was 2 people (3.4%) with no anxiety. The data showed a significant value of 0.000 (< 0.05) which can be interpreted that there is a relationship between the

length of suffering from hypertension and the level of anxiety in hypertensive patients at the Community Health Center Aceh Besar Regency, Indonesia. It can be stated that there is a significant relationship between the duration of hypertension and the level of anxiety of respondents. The longer the respondents experienced hypertension, the higher the level of anxiety felt by the respondents (Laksita, 2016). A person who has suffered from hypertension for a long time may become anxious caused by hypertension which tends to require relatively little treatment long, there is a risk of complications and can shorten life (Hawari, 2013). High blood pressure if not treated or treated, in the long term will damages blood vessels throughout the body, complications that can occur due to hypertension is stroke, diabetic retinopathy, acute or chronic kidney disease and coronary heart disease (Wijaya & Putri, 2013).

Hypertension classification has adverse health impacts such as ventricular hypertrophy, encephalopathy, myocardial infarction, nephosclerosis, renal insufficiency, stroke. This problem results in the elderly experiencing anxiety, dementia, sleep, physical, and social disorders. Social problems can occur because the elderly do not feel satisfaction in their lives, so slowly the elderly will feel isolated and the social interaction of the elderly will decrease (LeMone, Burke & Bauldoff, 2016). In this case, complications of hypertension are also a problem that can trigger anxiety in sufferers. Hypertension will generally cause problems that can aggravate the disease and affect the patient's daily activities. Because of this, patients are worried that they will lose their roles, status, power and others so that it can cause them to become less valuable in the eyes of their families and society.

CONCLUSION

Based on the results of the study, it was shown that there was a significant relationship between the length of suffering from hypertension and anxiety in the elderly with $p = 0.000$. In this case, anxiety is a problem that is generally experienced for hypertensive patients with high blood pressure, because the increasing anxiety of elderly patients about their disease also triggers a significant increase in blood pressure. Therefore, it is very important for the elderly to be able to control their anxiety so that the hypertension experienced does not getting worse.

ACKNOWLEDGEMENT

REFERENCES

Anggraini, D. (2014). Factors related to the incidence of hypertension in men aged 40–65 years at the West Bitung Health Center, Bitung City. FKM Sam Ratulangi University

Antoro, B., & Amatiria, G. (2018). *Effect of Guided Imagery Relaxation Technique on Anxiety Levels of Cataract Preoperative Patients*. Journal of Nursing, 13(2), 239. https://doi.org/10.26630/jkep.v13i2.938

Artiyaningrum, B. & Azam, M. (2016). Factors related to the incidence of hypertension are uncontrolled in patients who undergo routine checkups. *Public Health Perspective Journal*. http://journal.unnes.ac.id/sju/index.php/phpj

Cumayunaro, A., & Dephinto, Y. (2018). Life style With The Event Of Hypertension In Adult In The Working Areas Public Health Center In Andalas Padang. *Journal of Health Sciences Meditory, 2*(1), 163–170. https://jurnal.syedzasaintika.ac.id

Diartin, S.A., Zulfitri, R., & Erwin. (2021). Overview of Social Interaction of the Elderly Based on Hypertension Classification in the Elderly in the Community. *JIKKI JOURNAL* Vol 2 No. 2 November (2022), p. 126-137. P-ISSN: 2809-7181 | E-ISSN: 2809-7173. https://journal.amikveteran.ac.id/index.php/jikki

Hawari, D. (2013). *Stress management, anxiety and depression*. Jakarta.

Laksita, Indra Dwi. (2016). The Old Relationship of Suffering from Hypertension with Anxiety Levels in the Elderly in Praon Nusukan Village, Surakarta. Scientific Publications. Unpublished. Faculty of Health Sciences. University of Muhammadiyah Surakarta: Surakarta.

LeMone, Burke, & Bauldoff, (2016). *Medical Surgical Nursing, Translation.* Jakarta: EGC

Ministry of Health of the Republic of Indonesia. (2018). *Main Results of Riskesdas 2018*. Ministry of Health, Health Research and Development Agency.

Ministry of Health of the Republic of Indonesia. (2021). *The rate of anxiety disorders increased by 6.8 percent during the pandemic*. https://www.antaranews.com/berita/2444893/kemenkes-angka-gangguan-kecemasan-naik-68-persen-selama-pandemi

Sari, R. Y., Rohmawati, R., Faizah, I., Hasina, S. N., & Putri, R. A. (2023). The Effect of Murrotal Al-Qur'an on Pain and Hemodynamic Status in Patients with Coronary Heart Disease. *Journal of Nursing*, 15(2), 481-490.

Wijaya, A. S. & Putri YM. (2013). Medical Surgical Nursing I. Yogyakarta: Nuha Medika

World Health Organization (2017). *Depression and Other Common Mental Disorders: Global Health Estimates*. Geneva

World Health Organization. (2019). *Status Of The Health-Related SDGS*. SDGS: Monitoring for the SDGS. World Health.

World Health Organization. (2022). Hypertension (online) accessed from. https://www.who.int/newsroom/factsheets/detail/hypertension

SMARTBOARD MEDIA IN INCREASING SCIENCE LEARNING INTEREST OF STUDENTS AT SANTA URSULA MIDDLE SCHOOL, JAKARTA

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ABSTRACT

Learning is an interaction between teachers, students and the learning environment. The learning environment also includes the learning media facilities owned. This study aims to determine the extent to which the use of *smartboard media* in increasing the interest in learning science of students at SMP Santa Ursula Jakarta. Data collection techniques used interviews and questionnaires given to 3 science teachers, and 108 students at SMP Santa Ursula Jakarta. The data obtained for the total percentage of student questionnaire results was 80.88% while the total percentage value of the teacher questionnaire results was 87% . Based on the data obtained, it can be concluded that according to participants, the use of *smartboards* is in the good category in increasing learning interest while according to teachers, the use of *smartboards* is very good in increasing student learning interest.

Keywords: smartboard, learning media, learning interest.

INTRODUCTION

Learning is essentially an interaction between teachers, students, and the learning environment in an effort to achieve learning goals. In the learning process, teachers and students are two components that cannot be separated. Both components must have a mutually supportive interaction. The interaction between the two will be well established if there is a tool that can support the learning process. (Rahma, et al, 2019). The teaching and learning process will run effectively and efficiently if supported by the availability of supporting media. The provision of dynamic, conducive and dialogical educational media

and methodologies is very necessary for the development of students' potential, optimally. This is because the potential of students will be more stimulated if assisted by a number of media or facilities and infrastructure that support the interaction process being implemented.

Media or tools and learning resources have an important role in the learning process. Through the use of all these learning resources, it is expected to improve the quality of learning and development of students. A teacher can take advantage of the ease and sophistication of today's technology (Arifin, et al, 2022). Media in the learning process is directed so that the information mastered by students can be easily digested and understood. According to Zainiyati, 2017 in(Arifin, et al, 2022) It is emphasized that the function of media is as a tool to help teachers communicate messages, so that the communication process runs well and no errors occur. *Association for Education and Communication Technology* (AECT) defines media as any form used for the process of conveying information. While *the Education Association* (NEA) defines it as an object that can be manipulated, seen, heard, read or talked about along with instruments that are used properly in teaching and learning activities, can influence the effectiveness of instructional programs.(Arsyad, 2011)

The use of relevant media in the classroom can optimize the learning process. For teachers, learning media helps to concretize concepts or ideas and helps motivate active learners. For students, media can be a bridge to think critically and act. Thus, media can help teachers and students achieve the basic competencies that have been set. In order for learning media to be utilized properly, teachers need to know their learning needs and the problems faced by students about the material to be taught. Related to that, media needs to be developed based on relevance, basic competencies, materials and student characteristics. Teachers can act as creators, namely creating and utilizing media that is appropriate, efficient, and enjoyable for students. However, in its utilization in the classroom, it must be emphasized that students are the ones who should utilize the learning media. According to the behaviorist paradigm, learning is the transfer of knowledge from experts to novices (Isran Rasyid Karo-Karo S & Rohani, 2018).

The utilization of learning media means the ability of learners to utilize and take advantage of all existing learning media for the benefit of learners, both those used in schools and those outside of school. The utilization of learning media is now increasingly sophisticated, along with the sophistication of the development of science and technology, so that its benefits are greatly felt by learning implementers. Thus, the main emphasis of this study will describe the use of *Smartboard media* as one of the innovations of digital learning media to increase student interest in science learning in junior high schools.

Interest is a feeling of preference and attachment to something or an activity , without anyone telling you. According to (To'at, A. & Hidayah, F. F.,

2017)interest, it is a strong source of motivation and causes students' participation and activeness in learning activities. A similar opinion is explained by (Adodo, S.O. & Gbore, L. O. , 2012), that interest is one of the most important aspects in encouraging successful learning, because it will bring up good memories for students. According to (Djamarah, S. B. & Zain, A., 1996)students who lose interest in learning will more easily forget the material they have just learned. Therefore, according to (Haryanti & Wiyarsi, A, 2017)students with good learning motivation will show positive activities during learning, while students who tend to be passive are indicated to have low learning interest.

Natural Science is one of the main subjects at the elementary level. Natural science subjects have an important role to be taught at the elementary level, because these subjects teach students about how humans live in a relationship with their surroundings. Natural science learning not only provides knowledge to students but also provides experience in recognizing natural phenomena that occur and being able to respond according to the experiences and findings of students. Students gain an understanding of concepts and the development of useful natural science knowledge that can be applied in everyday life (Chasanah, Alif. et al, 2023). In general, some teachers still dominate the teaching and learning process by using the blackboard media. So that learning is boring and decreases student interest in the learning process.

Realize students in these problems, an appropriate learning media tool is needed that is able to visualize science learning materials well. Thus, the use of media can increase students' interest in learning materials. One of the limitations can be overcome by using technology media (Rahma, et al, 2019). The development of science and technology is increasingly encouraging efforts to improve and utilize the results of technology in the learning process. Law No. 20 of 2003 concerning the National Education System emphasizes that the development of technology for education is a conscious, planned effort to create an effective learning atmosphere and learning process so that students actively develop their potential. Based on this, sophisticated technology media is needed to create an active and educational learning atmosphere so that it can eliminate students' limitations in understanding learning (Rahma, et al, 2019).

Smartboard is an interactive whiteboard produced by smart technology company. Smart technology company was founded in 1987, but started producing smartboards a few years later. *Smartboard* allows users to prepare teaching materials at home then bring them to the classroom in the form of *flash drives* , and then connect them to *the smartboard* to get high-tech learning (Krantz, 2017). *Smartboard* is a learning medium that can facilitate the delivery of information, so that the learning process can be more practical, efficient, and fun. *Smartboard* has several functions, besides being a place to write, this whiteboard which is similar to a large LED television also functions like a computer or projector. All applications on the computer can be run directly on the *smartboard screen.* (Rahma, et al, 2019). *Smartboards* are very useful for

teachers and students, especially in the teaching and learning process, because *smartboards* provide several facilities in the form of mathematical applications that contain various tools needed in learning such as protractors, rulers, checkered paper and so on.

The use of *smartboard* is expected to produce interactive and multimedia-based learning materials and make it easier for teachers to deliver learning materials so that they can be well received by students (Rahma, et al, 2019). Based on research on the use (Nurhasanah et al, 2022)*of* smartboard learning media in science subjects for grade IV of SDN Rejosari, valid criteria were found with an average score of 4.42, while for practical criteria the average score was 88.4% and for effective criteria with t $_{count}$ = 11.02 and t $_{table}$ = 1.64. It was concluded in this study that smartboard media *meets* valid, practical and effective criteria so that it is suitable for use as a learning medium in science material for grade IV of elementary school. The existence of *smartboards* is no longer foreign to Indonesian people, especially in the world of education. *Smartboards* have been used in learning activities, one of which is at SMP Santa Ursula Jakarta.

Based on the description above, the researcher wants to know how the use of smart boards can increase the interest in learning science among students at Santa Ursula Middle School, Jakarta.

METHODS

This study used a qualitative method. The procedure in this qualitative study is scientific and systematic. The sample of this study came from 100 students and 3 teachers from Santa Ursula Junior High School (SMP) Jakarta. The research design used was descriptive qualitative. The object of the study was related to students' abilities in following science learning materials. The data collection and processing techniques used were through interviews and questionnaires. Interviews are data collection techniques used to collect information materials carried out by conducting oral questions and answers unilaterally, face to face, and have a specific purpose (Sudijono, 2011). In this study, interviews were conducted to determine teachers' responses regarding the use of smartboards *on* students' learning interests in science subjects. While questionnaires are data collection methods carried out by giving a set of questions or written statements to respondents to be responded to according to user requests (Widoyoko, 2016).

The questionnaire in this study was used to determine students' responses to the use of *smartboards* in science learning. Data analysis was carried out by calculating the number of alternative answers given by the questionnaire responses that had been distributed, with five alternative answers, namely (1) strongly disagree, (2) disagree, (3) normal, (4) agree, (5) strongly agree. After being calculated, it was then expressed as a percentage. After obtaining the percentage, it was then interpreted into the interpretation criteria. Questions from the questionnaire submitted to students included those related

to ease, attractiveness, and pleasure. Questions from the questionnaire submitted to educators included those related to ease, motivation and learning outcomes of students.

Table 1. Teacher Questionnaire

No	Teachers Responses to *Smartboard*	Answer Options				
		1	2	3	4	5
1	I know that smartboard is a technology-based learning media.					
2	I understand how to use the smartboard easily and precisely					
3	Students feel more motivated in learning using smartboards					
4	By using a smartboard, learning content is easier to convey to students.					
5	Student learning outcomes increase when using smartboard media					
6	Smartboards make it easier for educators in the learning process, especially in the science learning process, such as using smartboards for presentations, playing videos, etc.					
7	Smartboard is a media that can meet the needs of educators in applying learning plans easily and quickly.					
8	Smartboard helps educators in learning efficiently and effectively					

Table 2. Student Questionnaire

No	Student Responses to *Smartboard*	Answer Options				
		1	2	3	4	5
1	I understand the benefits and uses *of smartboards*					
2	I feel happy when learning using *smartboard media*					
3	I feel more motivated when learning using *the smartboard*					
4	I feel more focused when using *the smartboard*					
5	I feel that the content provided via *smartboard* is more interesting to understand.					
6	In the science learning process, I feel that learning using *a smartboard* makes it easier for me to understand.					
7	By using *a smartboard* , I can easily use various features on the laptop efficiently and easily in learning.					
8	*Smartboard* makes things easier for me in many ways during the science learning process, for example, I can more easily save notes written by the teacher.					
9	I had no difficulty using *the smartboard.*					
10	*Smartboards* are more attractive and easier to use than regular *whiteboards* .					
11	*Smartboard* facilitates the learning process well, such as using *power point* more easily, playing videos faster, etc.					

RESULTS AND DISCUSSION

The following is data obtained based on interviews and questionnaires. Interviews were conducted with three science teachers at SMP Santa Ursula Jakarta, while for students a random sample was taken from the total number of students as respondents. Interviews are one of the most widely used tools for collecting qualitative research data. (Rachmawati, 2007). Interviews allow researchers to collect diverse data from respondents in various situations and contexts (Sarosa, 2021).

Table 4. Teacher Interviews

Teacher Name	Learning Process Before Using *Smartboard*	Learning Process After Using *Smartboard*
Elisa Tri Meistiawan	The use of LCD is sometimes ineffective in the process of connecting data from a laptop / computer to be displayed on the available LCD. All must be available in the existing laptop or computer	In the learning process, it is not necessary to connect electronic devices for a long time to be displayed by students, but simply use an access card via all drive access in email on the *smartboard screen,* then it can be easily accessed and displayed by students.
F.A Dimas Wahyuanto	Less effective and learning only involves *sharing* PPT and videos via laptop/computer and then showing them on LCD	More interactive, optimizing digitalization in the learning process is able to motivate students in direct collaboration.
Yolanda Endear G.S	Less effective, so learning tends to be monotonous	Learning becomes easier, more interactive and more interesting for students, thus increasing students' motivation in learning and improving learning outcomes.

Student interview results

In the student interview stage, a random sample was taken from all class VII students at SMP Santa Ursula Jakarta, obtaining the following conclusions:

1. By using *a smartboard,* students tend to be more interested in the learning process because they can easily, quickly and effectively directly access learning materials together (collaboration).
2. The application of easy technology makes students understand the learning material better and quickly attracts students' attention.
3. It is easier to save data or notes from teacher explanations without having to worry about being left behind in the learning process in class, important notes in learning can easily be saved directly to the student's email.
4. The many conveniences in the *smartboard application* increase students' interest in learning in the science learning process, this is

apparent when the learning process runs interactively which makes the material understood optimally.

Table 5. Questionnaire Results on the Use of *Smartboard Media* in Teachers' Perceptions, N=3

No	Questionnaire Items	MIN	MAX	Average	SD
1	I know that *smartboard* is a technology-based learning media.	5	5	5	0
2	I understand how to use *the smartboard* easily and precisely	4	5	4.3	0.57735
3	Students feel more motivated in learning using *smartboards*	4	5	4.3	0.57735
4	By using *a smartboard* , learning content is easier to convey to students.	4	5	4.6	0.57735
5	Student learning outcomes increase when using *smartboard media*	4	4	4	0
6	*Smartboards* make it easier for educators in the learning process, especially in the science learning process, such as using smartboards for presentations, playing videos, etc.	4	5	4.6	0.57735
7	*Smartboard* is a media that can meet the needs of educators in applying learning plans easily and quickly.	4	4	4	0
8	*Smartboard* helps educators in learning efficiently and effectively	4	4	4	0

Based on table 5. obtained data from the results of filling out the questionnaire by 3 science subject teachers, it is known that for questionnaire items with an average of 5 the standard deviation value is 0, questionnaire items with an average of 4 the standard deviation value is 0, questionnaire items with an average of 4.3 the standard deviation value is 0.57 and an average of 4.6 the standard deviation value is 0.57.

Table 6. Questionnaire Results on the Use of *Smartboard Media* in Students' Perceptions, N=108

No	Questionnaire Items	Min	Max	Average	Standard Deviation
1	I understand the benefits and uses *of smartboards*	2	5	4.5	0.690137214
2	I feel happy when learning using *smartboard media*	2	5	4.1	0.835355801
3	I feel more motivated when learning using *the smartboard*	2	5	3.7	0.872843235
4	I feel more focused when using *the smartboard*	2	5	3.6	0.869615162
5	I feel that the content provided through *the smartboard* is more interesting to understand.	2	5	4.1	0.828438375

No	Questionnaire Items				
6	In the science learning process, I feel that learning using *a smartboard* makes it easier for me to understand.	2	5	3.7	0.98214415
7	By using *a smartboard* , I can easily use various features on the laptop efficiently and easily in learning.	3	5	4.2	0.774004346
8	*Smartboard* makes things easier for me in many ways during the science learning process, for example, I can more easily save notes written by the teacher.	2	5	4.1	0.880296608
9	I had no difficulty using *the smartboard.*	1	5	3.8	1,103,622,218
10	*Smartboards* are more attractive and easier to use than regular *whiteboards* .	2	5	4	0.873636009
11	*Smartboard* facilitates the learning process well, such as making it easier to use PowerPoint, playing videos faster, etc.	2	5	4.3	0.844576286

Based on table 6, the data obtained from the results of filling out the questionnaire by 108 students with the smallest standard deviation value being 0.69 with questionnaire item 1 and the largest standard deviation value being 1.1 with questionnaire item 9.

Table 7. Percentage Value of Student Questionnaire

No	Questionnaire Items	Questionnaire item values	Percentage	Overall presentation
1	I understand the benefits and uses of smartboards	488	90.3%	
2	I feel happy when learning using smartboard media	444	82.2%	
3	I feel more motivated when learning using the smartboard	410	76%	
4	I feel more focused when using the smartboard	393	72.7%	
5	I feel that the content provided via smartboard is more interesting to understand.	445	82.4%	
6	In the science learning process, I feel that learning using a smartboard makes it easier for me to understand.	403	74.6%	80.88%
7	By using a smartboard, I can easily use various features on the laptop efficiently and easily in learning.	455	84.2%	
8	Smartboard makes things easier for me in many ways during the science learning process, for example, I can more easily save notes written by the teacher.	447	82.7%	
9	I had no difficulty using the smartboard.	415	76.8%	
10	Smartboards are more attractive and easier to use than regular whiteboards.	438	81%	

11	Smartboard facilitates the learning process well, such as making it easier to use PowerPoint, playing videos faster, etc.	469	86.8%

Based on table 7, it is known that the total percentage of student questionnaire items is 86.6%.

Table 8. Percentage Value of Teacher Questionnaire

No	Questionnaire Items	Questionnaire item values	Percentage	Total Percentage
1	I know that smartboard is a technology-based learning media.	15	100%	
2	I understand how to use the smartboard easily and precisely	13	86%	
3	Students feel more motivated in learning using smartboards	13	86%	
4	By using a smartboard, learning content is easier to convey to students.	14	92%	
5	Student learning outcomes increase when using smartboard media	12	80%	87%
6	Smartboards make it easier for educators in the learning process, especially in the science learning process, such as using smartboards for presentations, playing videos, etc.	14	92%	
7	Smartboard is a media that can meet the needs of educators in applying learning plans easily and quickly.	12	80%	
8	Smartboard helps educators in learning efficiently and effectively	12	80%	

Based on table 8, it is known that the total percentage of teacher questionnaires is 87%.

Learning is a relatively permanent change in behavior or behavioral potential as a result of experience or reinforced practice. Learning is an activity or a process to acquire knowledge, improve skills, improve behavior, attitudes, and strengthen personality (Ariani, et al. 2022). In the process of learning science, human contact with nature is called experience . Ronald Gross in his book entitled *Peak learning* (1991), as a learning practice that is less conducive, undemocratic, does not provide opportunities for creativity and has not developed the full potential of students optimally, giving rise to several myths in learning such as learning is boring, is an unpleasant activity; learning is only related to the material and skills provided by the school; learners must be passive, accept and follow what the teacher gives; in learning, the learner is under the orders and rules of the teacher; learning must be systematic, logical and planned; learning must follow all predetermined programs. These myths

are based on various real factors experienced by students with limited facilities in education, minimal teacher ability in mastering technology, and the habituation of rigid ancient community views on the learning process, resulting in many things that are not directly proportional to modern education today. It is called modern education, because currently the learning process in any education must be directly proportional to existing technological advances.

Technological advances in the development of the modern world today make all lines of education have to process and organize themselves to optimize the best way so that students have good learning abilities and good learning interests. It is undeniable that the current generation of students is very literate with technology, so the use of technology in learning is very important. In accordance with the vision of a technology-based school, therefore, SMP Santa Ursula Jakarta has optimal facilities to support the learning process at school. One of the things used to support the learning process at school today is *a smartboard,* which is a media in the form of a smart board installed in each class as a replacement for *the whiteboard* that has been used so far. In addition to replacing *the whiteboard* , there are other features owned by *the smartboard.*

Based on the results of interviews conducted with respondents of 3 science teachers and students who filled out the questionnaire taken from a random sample of 108 grade VII students. Several conclusions were obtained from the use of *smartboards* during the science learning process. First, the use of *smartboards* in each class makes the learning process at SMP Santa Ursula which is based on technology easier. Second, *smartboards* are one of the media that can be used by teachers and students in the learning process by utilizing the facilities owned by the smartboard . With *smartboards* , the learning process is more interesting and easily accessible to students quickly. Third, optimal use of *smartboards* by involving students who are active in collaborating, and during the learning process all students are equipped with their own laptops to be able to connect directly to the *smartboard access* used by the teacher makes the learning process not monotonous, not rigid only centered on the teacher but all parties in the class are able to collaborate well. It is said that the interest in learning of students is increasing as seen in the interactive learning process and student learning outcomes owned by teachers during the science learning process.

However, behind its advantages, *smartboards* have weaknesses, namely because they are technology-based learning media so that in the process of using them 80% depends on the existing internet network. So that sometimes obstacles arise during the learning process if internet access experiences network disruptions.

CONCLUSION

The research conducted on school facilities at SMP Santa Ursula Jakarta, especially *smartboards,* was conducted using qualitative data collection techniques, data collection was conducted through interviews and questionnaires on students' learning motivation. The results showed that the use of *smartboards* has a positive impact on the science learning process, especially in increasing students' interest in learning in the classroom, as seen in the results of data obtained from interviews and questionnaires from teachers and students. The total percentage of questionnaires from students was 80.88% while the total percentage of teacher questionnaires was 87% with good and very good categories.

ACKNOWLEDGEMENT

The author would like to express his deepest gratitude to all parties who have been involved in helping in this research process.

REFERENCES

Adodo, SO & Gbore, LO . (2012). Prediction of Attitude and Interest of Science Students of Different Abilities on Their Academic Performance in Basic Science. *International Journal of Psychology and Counselling* , 4(6): 68-72.

Ariani, et al. 2022. Textbook of Learning and Teaching. Bandung: Widina Bhakti Persada.

Arifin, et al. (2022). *ICT-Based Learning Media.* Medan: UMSU Press.

Arsyad, A. (2011). *Learning Media.* Jakarta: PT Raja Grafindo Persada.

Arvianto, S & Widayati. (2020). *Development of Smart Board Mathematics Media in Mathematics Subjects with KPK and FPB Materials in Grade V.* Proceedings *of the UNNES National Postgraduate Seminar* .

Chasanah, Alif. et al. (2023). *The Effectiveness of Using Smart Board Media (PAPIN) on Science Learning Outcomes for Grade III SDN Plamongansari 02 Semarang. Journal of Education and Counseling* , 1584-1587.

Djamarah, SB & Zain, A. (1996). *Teaching and Learning Strategies.* Jakarta: Rineka Cipta.

Haryanti & Wiyarsi, A. (2017). Analysis of Chemistry Learning Interest of Grade XI Students of SMK Negeri 1 Temon. *Paper presented at the national chemistry seminar of UNY.* Yogyakarta State University.

Isran Rasyid Karo-Karo S & Rohani. (2018). BENEFITS OF MEDIA IN LEARNING. *AXIOM* , P-ISSN: 2087 – 8249, E-ISSN: 2580 – 0450.

Nurhasanah, Siti, et al. 2022. *Development of Smart Board Learning Media in Science Subjects for Grade IV of Rejosari State Elementary School* . Linggau Journal Science Education Vol. 2 No 3 (75-84). P-ISSN: 2798-2149. E-ISSN: 2798-1479.

Krantz. (2017). *A Primer of Mathematical Writing.* Providence, Rhode Island: American Mathematical Society.

Laila, Nur et al. 2022. The Use of Smart Boards in Increasing Students' Interest in Learning in the Independent Learning Curriculum. Sensaseda II, 82 - 88. ISSN 2963-2528

Rahma, et al. (2019). *Utilization of Smart Board on Transformation Material in Class VIII SPK SMP Teuku Nyak Arief Fatih Bilingual School Banda Aceh* , 64-72.

Sarosa, Samiaji. 2021. *Qualitative Research Data Analysis.* Depok: Kanisus.

To'at, A. & Hidayah, FF (2017). The Influence of Chemistry Teachers' Professional Competence on the Learning Interests of Class XII IPA Students at MAN 1 Semarang. *Paper presented at the national seminar on education, science and technology, faculty of mathematics and natural sciences* .

Anderson, M., & Reid, C. (2009). Don;t forget about levels of explanation. *Cortex: A Journal Devoted to the Study of the Nervous System and Behavior, 45*(4), 560-561.

Creswell, J. W. (2008). *Educational research: Planning, conducting and evaluating quantitative and qualitative research (3ʳᵈ Ed.).* Upper Saddle River, N. J.: Pearson Prentice Hall.

Howitt, D., & Cramer, D. (2008). *Introduction to research methods in psychology* (2ⁿᵈ ed.). Harlow: FT Prentice Hall.

Irsyadillah, A. (2016, July 11). "Project Fear" campaign: Lessons from the EU referendum in the UK. *The Jakarta Post*, p. 10.

Joseph, J. E. (2010). Identity. In C. Llamas & D. Watt (Eds.), *Language and identities* (pp. 9–17). Edinburgh: Edinburgh University Press.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. New York: Sage Publications.

Oliver, R., Harper, B., Wills, S., Agostinho, S., & Hedberg, J. (2007). Describing ICT-based learning designs that promote quality learning outcomes. In H. Beetham & R. Sharpe (Eds.). *Rethinking pedagogy for a digital age: Designing and delivering e-learning* (pp. 64-80). London: Routledge.

Shobhadevi, Y. J., & Bidarakoppa, G. S. (1994). Possession phenomena: As a coping behaviour. In G. Davidson (Ed.), *Applying psychology: Lessons from Asia-Oceania* (pp. 83-95). Carlton: Australian Psychological Society.

Wardah, I. (2008). To what extend can the WTO Agreements help to combat poverty in developing countries? (Unpublished Master's thesis). University of Southampton, Southampton.

Williams, J., & Jacobs, J. (2004). Exploring the use of blogs as learning spaces in the higher education sector. *Australian Journal of Educational Technology, 20*(2), 232-247.

Yuhetty, H. (2002). *ICT and Education in Indonesia.* Retrieved from http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan0112 86.pdf

SCIENTIFIC PUBLICATIONS IN EDUCATION: A "SCOURGE" FOR ACADEMICS

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ABSTRACT

Scientific publication is an academic activity that must be carried out. This article aims to analyze scientific publications in education: the "scourge" for academics. Several academics consisting of 10 lecturers, 10 teachers, and 10 students were interviewed to obtain valid data. Apart from that, observations and analysis of several documents were carried out to support valid data. The results show that academics have difficulty carrying out scientific publications due to limited knowledge and information regarding how to write scientific articles by journal standards, difficulty finding credible journals, difficulty identifying journals that suit the topic and scope of the article, language limitations, high publication costs, and intensity. Rejection from the journal editor. Based on the treatment carried out, namely through training on the effective scientific publication strategy "MeRePeCeKoRe", there was an increase in the knowledge and ability of academics to conduct scientific publications by 80%. Academics need practice and a habit of writing articles to improve their skills in scientific publications.

Keywords: scientific publications, education, academics.

INTRODUCTION

Scientific publication is one of the mandatory activities that must be carried out by academics, students, teachers, and lecturers. Scientific publication is the dissemination of research results or scientific studies in the form of scientific journal articles, books, conferences, and scientific presentations to the public

and scientists through various media (Abrams, et.al, 2019; Beck, et.al, 2019; Bakhtiar, 2023). The benefits of scientific publication include as a requirement for promotion or graduation, as conveyed by Gusmuliana, et.al (2022) that the government requires every Indonesian student, especially those who are studying at the doctoral level to publish in international journals before graduating. Nawaz, et.al (2023) stated that the involvement of medical students in research projects for years at the beginning of medical school is also positively related to ongoing scientific publications before and after graduation. Another benefit is to improve the reputation and existence of researchers as stated by Rotolo, et.al (2022), namely one of the benefits of scientific publications carried out by researchers is to build a reputation, attract and retain researchers, access external knowledge, and resources and support commercialization strategies. Polas (2023) states that the benefits of scientific publications are proof of competence and portfolio. Estevez, et.al (2022) states that research track records are used for future research development. Meanwhile, Li, et.al (2018) state that scientific publications can contribute to the development of science, and Pulford, et.al (2022) states that scientific publications can build national and international networks.

Carrying out scientific publications in accredited national journals or reputable international journals is not easy. The above was also experienced by several lecturers and students at PTN A and teachers at SMPN A. The urgency of this article is to analyze why scientific publications in education are seen as a "scourge " for academics.

METHODS

To obtain valid data, in-depth interviews were conducted with 10 lecturers and 10 students at PTN A and 10 teachers at SMPN A. In addition, direct observation was conducted in the training activities for compiling scientific articles in the Sinta journal for lecturers, students, and teachers to see the extent of the participant's knowledge and skills in conducting scientific publications, especially the publication of scientific articles in the Sinta journal. Based on the results of in-depth interviews, observations, and document results from the training, data triangulation was carried out, namely comparing various data and information obtained from the three techniques to obtain valid and credible data. Data analysis was carried out using the case study stages proposed by Stake, namely data category aggregation, direct interpretation, forming patterns, and naturalistic generalization. In this case, the researcher must determine what to look for, create code categories, and determine potential correspondents. In data analysis, the researcher used coding techniques consisting of open coding, axial coding, and selective coding. In open coding,

the researcher recapitulates and conceptualizes the data. In axial coding, the researcher categorizes. In selective coding, researchers connect the categories that have been created with the research object.

RESULTS AND DISCUSSION

The results of the study show that writing scientific articles and publishing them in national and international journals is not an easy thing to do for lecturers, students, and teachers. The following are the results of research on the knowledge and skills of 10 lecturers, 10 students of PTN A, and 10 teachers of SMPN A regarding scientific publications:
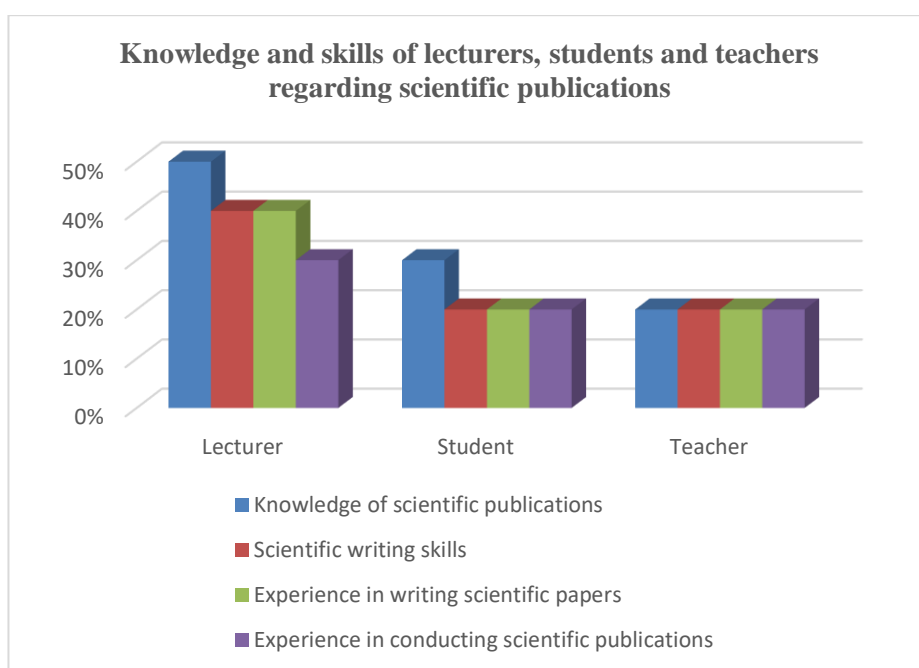
Figure 1. Knowledge and skills of lecturers, students, and teachers regarding scientific publications

Based on the figure, it shows that 5 lecturers, 3 students, and 2 teachers know of scientific publications, while those who have skills in writing scientific papers and experience in writing scientific articles are only 4 lecturers, 2 students, and 2 teachers, those who have experience in conducting scientific publications are only 3 lecturers, 2 students, and 2 teachers. The low level of knowledge regarding scientific publications, especially in journals, is the reason why lecturers, students, and teachers have a negative perception of scientific publications in accredited national journals and reputable

international journals. Based on the theory of planned behavior (Ajzen, 1991), states that a person's attitude towards an object will influence a person's desire to behave which will ultimately determine the person's real behavior. The perceptions and attitudes of lecturers, students, and teachers regarding the difficulty of conducting scientific publications, especially journal article publications, are a "scourge", so they are reluctant to write and publish. This is also supported by the results of research by Abdilllah, et.al (2020), namely that the low level of knowledge of lecturers regarding scientific publications at PT A and B in Pekanbaru City affects the minimal output of quality scientific publications at both PTs.

Based on the results of in-depth interviews, the following data was obtained:

Table 2. Obstacles in publishing articles in journals.

No.	Obstacles	Lecture	Student	Teacher
1.	Due to limited knowledge and information regarding how to write scientific articles by journal standards	8	10	10
2.	Difficulty finding credible journals	9	10	9
3.	Difficulty identifying journals that suit the topic and scope of the article	8	10	10
4.	Language limitations	8	10	10
5.	High publication costs and intensity	10	10	10
6.	Rejection from the journal editor	10	10	10

Based on the table above, shows that lecturers, students, and teachers stated that the main obstacles in publishing scientific articles in journals are high publication costs and rejection from journal editors. Other obstacles are limited knowledge and information on how to write scientific articles according to journal standards, difficulty finding credible journals, difficulty identifying journals that match the topic and scope of the article, and language limitations. This is also reinforced by several studies, including the results of research by Marmoah, et.al (2021) showing that the competence of teachers at Elementary Schools in Nogosari District, Boyolali Regency in research and publication is only 26.98%. Nuriadi, et.al (2023) stated that some of the obstacles faced by lecturers in publishing research results are the ability to write and find ideas, the ability to use technology, foreign language skills, minimal collaboration, and literature reviews. Andriyani (2023) stated that the obstacles experienced by students in conducting scientific publications are that students have difficulty in determining target journals students do not yet know about writing scientific journals and have not mastered online technology in publishing research results through online journals.

The results of the study show that through training on effective scientific publication strategies "MeRePeCeKoRe" There was an increase in the knowledge and abilities of lecturers, students, and teachers in conducting scientific publications, especially the publication of scientific articles in journals, by up to 80%. "MeRePeCeKoRe" adalah akronim dari "(1) Mencari jurnal yang kredibel, (2) Review artikel jurnal yang dituju, (3) Penulisan artikel

sesuai template jurnal, (4) Cek ricek kelengkapan dan kualitas artikel, (5) Kolaborasi interdisipliner, dan (6) Responsif terhadap umpan". Training by accustoming participants to carry out the six stages increases participants' knowledge and skills. Based on the Classical Conditioning theory put forward by Pavlov (1941) where behavior can be obtained through a habituation process, namely a repetitive process, habituation carries out 6 stages "MeRePeCeKoRe" can increase knowledge, skills, and experience in publishing scientific articles in journals.

CONCLUSION

Lecturers, students, and teachers must have knowledge, skills, and experience in conducting scientific publications, especially the publication of scientific articles in accredited national journals and reputable international journals for various scientific reasons, both educational, professional, and commercial reasons. Adequate knowledge and skills and the habit of carrying out the "MeRePeCeKoRe" stages can improve the quality of scientific publications in lecturers, students, and teachers.

ACKNOWLEDGEMENT

REFERENCES

Abdillah, M.R., Seswandi, A., Anita, R. (2020). Peningkatan Pemahaman Mengenai Penyebab Naskah Publikasi Ditolak Oleh Jurnal Berkualitas. *Diklat Review: Jurnal Manajemen Pendidikan dan Pelatihan*, 4(3): 262-268.

Abrams, M., Bruijns, S.R., Hoving, D.J. (2019). Dissemination patterns of scientific abstracts presented at the first and second African Conference of Emergency Medicine. *African Journal of Emergency Medicine*, 9(2), 101-105. https://doi.org/10.1016/j.afjem.2019.01.012

Andriyani. (2023). Pemahaman tentang Publikasi Ilmiah Pada Mahasiswa S1. *Jurnal Aksi Dosen dan Mahasiswa,* 1(1): 45 – 56.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.

Beck, S., Mahdad, M., Beukel, K., & Poetz, M. (2019). The value of scientific knowledge dissemination for scientists—a value capture perspective. *Publications*, *7*(3),54.https://doi.org/10.3390/publications7030054

Bukhori, M. L. (2023). *Teknik publikasi ilmiah teori dan penerapan*. Purbalingga: CV Eureka Media Aksara.

Estevez, A.V., Sanchez, P.G., Munoz, J.A.M., & Cobo, M.J. (2022). Why do papers from international collaborations get more citations? A bibliometric analysis of library and information science papers. *Scientometrics*, 127:7517–7555. https://doi.org/10.1007/s11192-022-04486-4

Marmoah, S., Istiyati, S., Hadiyah, & Mahfud, H. (2021). Tingkat kompetensi guru dalam penelitian dan publikasi artikel ilmiah untuk pengembangan profesionalisme. *Jurnal Basicedu*, 5(5): 4369-4376. https://doi.org/10.31004/basicedu.v5i6.1577

Nawaz, I., Thomas, J.A., Gupta, P., Shellah, D., Gaman, M.A., Puyana, J.C., Escobar, F.J.B. (2023). Should a scientific publication be a prerequisite to graduate from medical school? *International Journal of Medical Students.* https://doi.org//10.5195/ijms.2023.2124

Nuriadi, Gunawan, Verawati, N. N. S. P., Alqadri, B., & Jiwandoni, I. S. (2023). Sosialisasi strategi penulisan artikel ilmiah pada jurnal internasional bereputasi pada dosen FKIP UNRAM. *Jurnal Pengabdian Magister Pendidikan IPA*, 6(2): 243-252. https://doi.org/10.29303/jpmpi.v6i2.4196

Gusmuliana, P., Arsyad, S., Noermanzah, Apriani, E., & Syafryadin. (2022). Problems and expectations on international journal publication by faculty members of the English Department of Islamic Institutes in Indonesia. *Al-Ishlah: Jurnal Pendidikan,* 14(2): 2387-2400. https://doi.org//10.35445/alishlah.v14il.1584

Li, G., Jin, Y., Mbuagbaw, L., Dolovich, L., Adachi, J.D., Levine, M.A.H., Cook, D., Samaan, Z., & Thabane, L. (2018). Enhancing research publications and advancing scientific writing in health research collaborations: sharing lessons learnt from the trenches. *J Multidiscip Healthc*, 11: 245-254. https://doi.org//10.2147/JMDH.S152681

Pavlov, I.P. (1941). *Lectures on Conditioned Reflexes: Conditioned Reflexes and Psychiatry*. New York: International Publishers.

Polas, M.R.H. (2023). Publish or perish! Challenges and strategies in publishing research papers in top-tier academic journals. *Journal of Business & Management,* 2(1):11-22. https://doi.org//10.47747/jbm.v2il.1593

Pulford, J., El Hajj, T., Tancred, T., Ding, Y., Crossman, S., Silvester, L., Savio, M., Bevan, N., Tagoe, N, & Bates, I. (2022). How international research consortia can strengthen organizations' research systems and promote a conducive environment and culture. *BMJ Global Health*, 8: 1-11. https://doi.org//10.1136/bmjgh-2022-011419

Rotolo, D., Camerani, R., Grassano, N., & Martin, B.R. (2022). Why do firms publish? A systematic literature review and a conceptual framework. *Research Policy*, 51(10): 1-20. https://doi.org/10.1016/j.respol.2022.104606

PROFILING STUDENTS' SELF-REGULATION IN SCIENCE LEARNING AMONG MIDDLE SCHOOL STUDENTS IN URBAN AREAS

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ABSTRACT

Students often face challenges in studying science due to the need to independently absorb and process large amounts of knowledge. To address this, developing students' ability to control and monitor their learning independently is essential. This study investigates self-regulation in science learning among middle school students in urban areas through a quantitative survey-based approach. A 27-item self-regulation questionnaire with a 5-point Likert-type response format was administered to 139 students in Jakarta and West Java, with 64% from grade 7 and 36% from grade 8. The questionnaire demonstrated high reliability (Cronbach's Alpha = 0.995) and validity. Descriptive statistics revealed that 26.62% of students exhibit Very High self-regulation, 58.99% High, and 14.39% Moderate. These findings indicate that urban middle school students possess well-developed self-regulatory abilities, which can significantly enhance their science learning outcomes. This study contributes to the understanding of self-regulation in science education, providing a foundation for educators and policymakers to design targeted strategies that strengthen self-regulated learning. Future research could explore its impact across different educational settings or evaluate interventions to improve specific aspects of self-regulation in science learning.

Keywords: self-regulation, science learning, middle school, urban education.

INTRODUCTION

Classroom learning contexts vary in complexity (Moote, 2019). With the rapid development of information, student behavior has also become diverse (National Research Council, 2000). Some students feel curious about the phenomena that occur, some do not. In addition, scientists argue that students have difficulty studying science because they have to independently absorb large amounts of knowledge (Solé-llussà et al., 2021). Therefore, developing students' ability to control and monitor their learning independently is necessary. This way, they will know what they need to learn, why they need to know it, and how they can gain that knowledge (Sha et al., 2012). This ability to control and monitor what they need to learn, the reason why they need to learn it, and the strategy of how they can gain that knowledge is called self-regulation.

Self-regulation and motivation are essential for students' learning, especially in the context of 21st-century education, which requires students to be more active and engaged in the learning process (student-centered) (Tanti et al., 2020). The scope of science in junior high school focuses on observing natural phenomena and their applications in daily life, as well as addressing issues related to productive competence and the expansion of abstract concepts. Learning abstract concepts often presents challenges for students in understanding science lessons. Therefore, students need to develop a positive attitude toward the subject. These attitudes significantly influence their self-regulation and motivation in learning. Additionally, learning independence is a crucial aspect of the learning process. Independent learning is essential for all teenagers, including both students and non-students, as it fosters responsibility, self-organization, and discipline while also enhancing their ability to learn (Patriot & Laksono, 2024).

Students' self-regulation plays a critical role in interdisciplinary tasks (Zheng et al., 2020). Zimmerman, 1989, 2002; Zimmerman & Schunk, 2001 operationalized self-regulated learning (SRL) as a dynamic and cyclical process consisting of three phases: forethought, performance, and self-reflection. In the forethought phase, learners prepare for the task by analyzing its requirements and setting specific goals, which then guide their subsequent actions and behaviors. During the performance phase, learners implement strategies to control and monitor their cognitive processes, influencing the progress or stagnation of the task. Finally, in the self-reflection phase, learners evaluate their learning outcomes and optimize their responses based on internal or external feedback. Self-reflection can either foster momentum or create obstacles for future self-regulated learning efforts.

Central to this concept is the idea of agency, suggesting that individuals possess self-beliefs that enable them to exert control over their thoughts,

emotions, and actions (Bandura & National Ins of Mental Health, 1986). What distinguishes "self-regulated" individuals is not their reliance on learning methods carried out separately from social influences, but rather their personal drive, persistence, and adaptive abilities (Zimmerman, 1989). In summary, self-regulated learners are characterized by their active involvement in shaping and directing their own learning experiences.

Despite increasing recognition of the importance of psychosocial factors in education, there is still a lack of research in Indonesia that specifically examines how factors such as self-regulation influence students' learning processes, especially in the context of science education. These gaps become more apparent when focusing on middle school students in urban areas, where unique challenges and opportunities may shape their learning experiences. To address this gap, the primary aim of this study was to profile the students' self-regulation among middle school students in urban areas. Therefore, this study aims to contribute valuable insights into the development of targeted interventions and educational strategies that support students' academic growth in these settings.

METHODS

This study employs a quantitative research approach using the survey method. The data were analyzed using percentage calculations, following Creswell's framework (2016). The research was conducted in schools located in Jakarta and West Java, targeting middle school students in grades 7 (89 students) and 8 (50 students) from three schools in these regions. A total of 139 students participated in this study, representing the entire research population. The primary data collection instrument was a self-regulation questionnaire specifically designed for science learning. This questionnaire had been previously developed and demonstrated high validity and reliability, with a Cronbach's alpha coefficient of 0.995. The instrument consisted of 27 items. Items with a 5-point Likert scale consisting of five possible responses which are 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly agree). The questions were structured based on self-regulated learning indicators. The sample items can be seen in Table 1.

Table 1. Self-regulation Indicators

Aspect	Statement	Scale				
		5 (strongly agree)	4 (agree)	3 (neutral)	2 (disagree)	1 (strongly disagree)
Learning Strategy	I repeat the material being studied when studying science.					

Aspect	Statement	Scale				
		5 (strongly agree)	4 (agree)	3 (neutral)	2 (disagree)	1 (strongly disagree)
Time and Effort Management	I try to concentrate when studying science so as not to miss important points in science topics.					
Self-evaluation	I try to solve questions to test my understanding of the science topics I am studying.					

Data collected were analyzed statistically by using Microsoft Excel 2016. Microsoft Excel was used to analyze the percentage that each students get and categorize into very low, low, moderate, high, and very high. The criteria of self-regulated learning based on the percentage (%) can be seen in Table 2.

Table 2. The criteria of self-regulation based on the percentage (%)

No.	Interval	Criteria of self-regulation
1	81% - 100%	Very high
2	61% - 80%	High
3	41% - 60%	Moderate
4	21% - 40%	Low
5	0% – 20 %	Very low

RESULTS AND DISCUSSION

Based on the questionnaire distributed online via Google Forms, a total of 139 students from grades 7 and 8 participated as respondents. These students were from two different provinces: Jakarta and West Java. Of the total respondents, 89 were from grade 7, while 50 were from grade 8. The percentage distribution of students by grade level is presented in Figure 1.
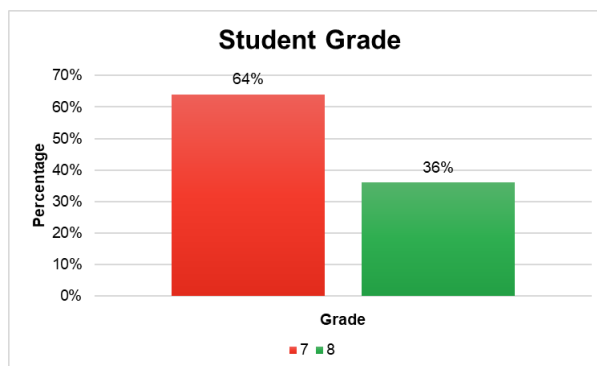
Figure 1. Students' Grade

The respondents were all from urban areas in the two provinces, with 75 students from Jakarta and 64 students from West Java. The percentage distribution of respondents by province is shown in Figure 2.
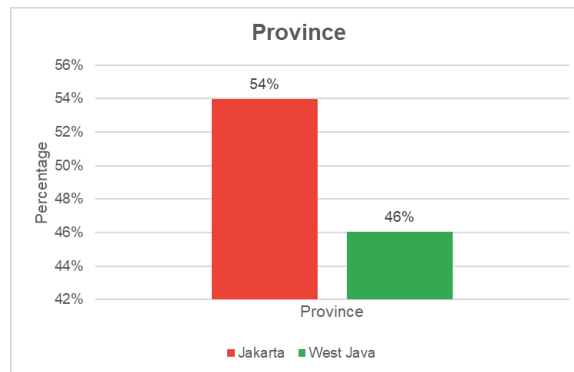
Figure 2. Province

Descriptive analysis was conducted to summarize and describe the data, providing insights into the patterns, trends, and characteristics observed within the sample population. The results of this analysis are presented in Table 3.

Table 3. Descriptive Analysis

Mean	Median	Mode	Standard Deviation	Minimum	Maximum	Count
98.24	98	108	14.94	62	132	139

Based on the data presented in Table 3, the mean score of students' self-regulation, which encompasses three key aspects; learning strategies, time and effort management, and self-evaluation is 98.24. The maximum observed score is 132, while the minimum is 62. Additionally, the standard deviation of 14.94 indicates moderate variability in the self-regulation levels among the students, suggesting diverse individual differences in how students manage their learning processes. Some students might excel in managing their learning, while some students still struggle.

Following the descriptive analysis, data tabulation was conducted to classify students into five categories: very low, low, moderate, high, and very high levels of self-regulation. The percentage distribution for each category was calculated to provide a clearer understanding of the overall trends and the proportion of students falling into each group. The student's classification based on each category can be seen in Table 4.

Table 4. Student Self-Regulation Level

Scale	Category	Frequency	Percentage
81% - 100%	Very High	37	26.62%
61% - 80%	High	82	58.99%
41% - 60%	Moderate	20	14.39%
21% - 40%	Low	0	0.00%
0 - 20%	Very Low	0	0.00%

The analysis of students' self-regulation levels, as shown in Table 4, reveals that most students exhibit high to very high levels of self-regulation. The scale of 81% - 100% categorized as very high level shows a total of 37 students (26.62%) indicating that these students consistently use self-regulation strategies effectively in their learning. Meanwhile, the majority of students, 82 students (58.99%) are categorized as having high self-regulation. This suggests that these frequently employ self-regulation strategies, though not as consistently as those in the "very high" category. Additionally, a smaller portion of students, 20 students (14.39%), demonstrate moderate levels of self-regulation. These students occasionally use self-regulation strategies but may lack consistency or struggle with some aspects of self-regulation. There is no students who fall into low and very low categories, indicating that all students exhibit at least moderate levels of self-regulation. The absence of students in the "low" and "very low" categories suggests that the overall self-regulation levels among the sample are relatively strong. This distribution reflects positively on the student's ability to manage their learning processes and could imply that existing educational practices are supporting the development of self-regulation effectively.

The findings provide valuable insights into the self-regulation profiles of students in urban areas, specifically in the context of science learning. The majority of students (58.99%) demonstrated high levels of self-regulation, while an additional 26.62% exhibited very high levels. This suggests that urban students in the sample possess strong abilities to manage their learning through effective strategies, time and effort management, and self-evaluation. These results may reflect the influence of urban educational environments, which often provide greater access to resources, structured learning opportunities, and exposure to competitive academic settings (Wood, 2023). Self-regulated learning is characterized by students' independence, where they take responsibility for their learning and are intrinsically motivated to complete their studies. Their improved learning outcomes are driven not by external

encouragement but by their own determination and effort (Patriot & Laksono, 2024). Furthermore, Velayutham et al. (2011, 2013) stated that students' self-regulation is also influenced by their motivation. However, it remains unclear whether self-regulation is more significantly affected by internal motivation or external motivation.

This study underscores the importance of fostering self-regulation as a critical skill for science learning, particularly in urban contexts, and provides a foundation for future research and the development of tailored educational programs to support diverse learner needs. However, this research is limited to students who are in urban areas. Further research can be carried out by taking students in non-urban areas as samples to analyze the differences in self-regulation between students in urban and non-urban areas.

CONCLUSION

This study has profiled the self-regulation levels of middle school students in urban areas, focusing on their science learning processes. The findings of this study provide valuable insights into the self-regulation profiles of students in urban areas, specifically in the context of science learning. The majority of students (58.99%) demonstrated high levels of self-regulation, while an additional 26.62% exhibited very high levels. This suggests that urban students in the sample possess strong abilities to manage their learning through effective strategies, time and effort management, and self-evaluation. These results underscore the positive impact that urban educational environments can have on fostering self-regulated learning. However, the presence of a moderate proportion of students with only average levels of self-regulation suggests the need for targeted interventions to support and enhance these skills in less proficient learners. Future research could expand on this work by exploring the psychosocial and environmental factors influencing self-regulation in rural or suburban areas, as well as examining the effectiveness of interventions designed to enhance these skills across various demographic groups.

REFERENCES

Bandura, A., & National Ins of Mental Health. (1986). *Social foundations of thought and action: A social cognitive theory*.

Moote, J. (2019). Investigating the Longer-Term Impact of the CREST Inquiry-Based Learning Programme on Student Self-regulated Processes and Related Motivations : Views of Students and Teachers. *Research in Science Education*, *49*(1), 265–294. https://doi.org/10.1007/s11165-017-9621-7

National Research Council. (2000). *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning*. The National Acaemies Press. https://doi.org/10.17226/9596

Patriot, E. A., & Laksono, P. J. (2024). Profile of Self-Regulated Learning on First-

Year Students at Science Education Department in Online Learning. *Paedagogia*, *27*(1), 93. https://doi.org/10.20961/paedagogia.v27i1.84009

Sha, L., Looi, C.-K., Chen, W., & Zhang, B. H. (2012). Understanding mobile learning from the perspective of self-regulated learning. *Journal of Computer Assisted Learning*, *28*, 366–378. https://doi.org/10.1111/j.1365-2729.2011.00461.x

Solé-llussà, A., Aguilar, D., & Ibáñez, M. (2021). Video worked examples to promote elementary students ' science process skills : a fruit decomposition inquiry activity. *Journal of Biological Education*, *55*(4), 368–379. https://doi.org/10.1080/00219266.2019.1699149

Tanti, Maison, Syefrinando, B., Daryanto, M., & Salma, H. (2020). Students' self-regulation and motivation in learning science. *International Journal of Evaluation and Research in Education*, *9*(4), 865–873. https://doi.org/10.11591/ijere.v9i4.20657

Velayutham, S., Aldridge, J., & Afari, E. (2013). Students' Learning Environment, Motivation and Self-Regulation: A Comparative Structural Equation Modeling Analysis. In *Application of Structural Equation Modeling in Educational Research and Practice*. Brill. https://doi.org/10.1007/978-94-6209-332-4

Velayutham, S., Aldridge, J., & Fraser, B. (2011). Development and validation of an instrument to measure students' motivation and self-regulation in science learning. *International Journal of Science Education*, *33*(15), 2159–2179. https://doi.org/10.1080/09500693.2010.541529

Wood, R. M. (2023). A Review on Education differences in Urban and Rural Areas. *International Research Journal*, *14*(2), 1–3. https://doi.org/10.14303/2141-5161.2023.254

Zheng, J., Xing, W., Zhu, G., Chen, G., Zhao, H., & Xie, C. (2020). Profiling self-regulation behaviors in STEM learning of engineering design. *Computers and Education*, *143*, 103669. https://doi.org/10.1016/j.compedu.2019.103669

Zimmerman, B. J. (1989). A Social Cognitive View of Self-Regulated Academic Learning. *Journal of Educational Psychology*, *81*(3), 329–339.

Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner : An Overview. *Theory Into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J., & Schunk, D. H. (2001). Reflections on theories of self-regulated learning and academic achievement. In *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 289–307). Lawrence Erlbaum Associates Publishers.

Impact of Hyperparameter Optimizer for Image Malware Detection

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ABSTRACT

Image-based malware detection has become an area of further research in dealing with image-based malware attacks. Various deep learning models have been used to improve detection accuracy. One popular architecture is VGG16, a convolutional network widely used in image classification. In this study, we explore the impact of hyperparameter tuning on the optimization of the VGG16 model for image-based malware detection. The hyperparameter experiments conducted in this study are optimizer, and the number of epochs. Through 6 experiments with parameter variations, we evaluate the performance of the VGG16 model using several SGD, and Adam optimizers and the number of epochs consisting of 100, 250 and 500 epochs. The experimental results show that the selection and tuning of the optimizer can affect the performance of the model in terms of accuracy and training efficiency. The optimized Adam optimizer gives the best results, with higher detection accuracy than the SGD optimizer. The results show that the Adam optimizer has the highest accuracy reaching 85%.

Keywords: VGG16, Adam, SGD, Optimizer.

INTRODUCTION

In recent years, cybersecurity threats have increased rapidly. One of the most common attacks is malware. Malware can cause significant losses to individuals and organizations, including data theft, system failures, and service disruptions. (Rathore et al., 2018) . Therefore, developing effective methods to

detect and prevent malware is very important. Machine learning-based malware detection has shown more effective results compared to other methods (Firdausi et al., 2010) . especially with the use of image processing techniques to analyze suspicious files and identify behavioral patterns.

One of the important aspects in developing a machine learning model is hyperparameters. Hyperparameters are parameters that are set before the model training process and can affect the model's performance. In image-based malware detection, selecting the right optimizer and tuning hyperparameters can improve the accuracy and efficiency of detection. Various optimizers, such as Adam, and SGD have different characteristics in the parameter update process that can affect the final result of malware detection.

Currently, research related to image-based malware detection in machine learning has been widely conducted, but studies on image-based malware detection are still limited. Previous studies have been conducted including Image-based malware detection systems can use Convolutional Neural Network (CNN) based model algorithms (Gibert et al., 2018) . Several studies have been conducted by Gibert (Gibert et al., 2018) using the Convolutional Neural Network model with a bytes dataset. In the following year, research was conducted using the same model but using the gray bytes dataset (Gibert et al., 2019) . Kalash et al. used CNN with 25 epochs (Kalash et al., 2018) . While (Le et al., 2018) used CNN with 100 epochs. Transfer learning has been used by Salas et al. (Salas et al., 2023) with achievements on the MobileNet architecture.

Hyperparameter optimization can improve model performance including image recognition. Therefore, this paper aims to conduct hyperparameter optimizer experiments on model performance in detecting malware from file images.

METHODS

Data Collection

In this study, the dataset used is the Maldeb dataset. This dataset consists of 1905 samples divided into 2 labels, namely 1033 malware and 872 benign. Maldeb is an image-based dataset that has been converted from binary samples to images as depicted in Figure 1.
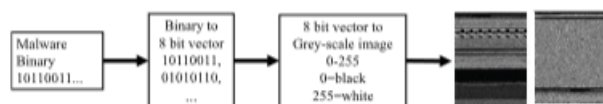
Figure 1. Extraction Method

Extracting binary samples into images produces malware and benign samples as shown in Figure 2.
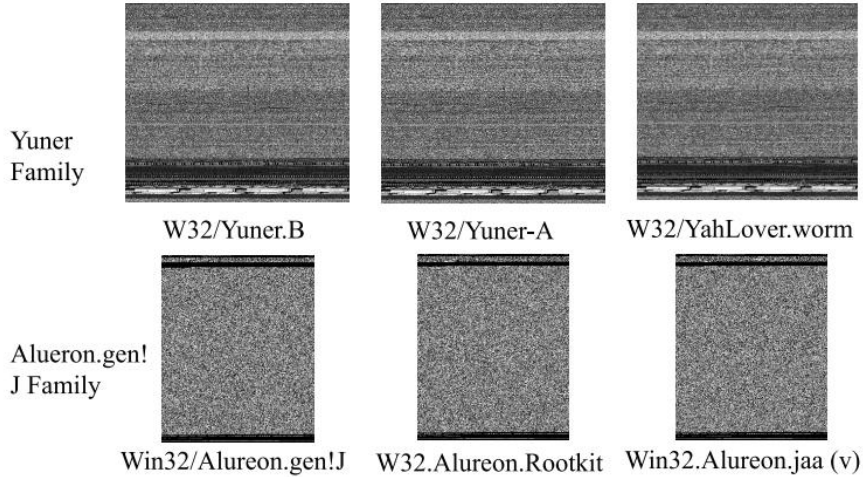
Figure 2. Image Malware Dataset (July & Ismail, 2024)

Design

The model architecture used in this study uses the VGG16 base model that has been pre-trained using the ImageNet dataset. This architecture is built on a series of convolutional layers with 3x3 kernels, which repeatedly capture local patterns from the input image. One of the reasons for choosing the VGG16 architecture is the simplicity of its design which only uses 3x3 filters in each convolutional layer, with a 2x2 pooling layer to reduce spatial dimensions, without sacrificing classification accuracy.

Input Layer

The classification process starts from the input layer, which receives images in a 224x224x3 format, according to the VGG16 architecture standard. In detecting malware, the input data is an image representation generated from a malware file that is converted into a visual image. This visual representation allows the network to capture patterns that are difficult to capture by manual feature-based techniques.

VGG16 as Feature Extractor

The VGG16 model used in this architecture acts as the primary feature extractor. The convolution layers are responsible for capturing the important features of the input image through 13 consecutive convolution layers. Each convolution layer uses a 3x3 kernel, with increasing filter depths from 64, 128, 256, to 512 in each block. After each convolution block, a 2x2 Max Pooling layer is used to reduce the spatial dimension, which helps in reducing the computational complexity while retaining the important features.

Flattening and Dense Layer

After the output of the last layer of VGG16, which is a three-dimensional tensor, this layer is then flattened into a one-dimensional vector. This process is necessary so that the data can be passed to the following Dense layer. The Dense layer added to this architecture consists of 512 neurons and uses the ReLU activation function. This layer is responsible for capturing the non-linear relationship between the features extracted by VGG16 and the malware class label.

Dropout for Regularization

We add a Dropout layer after the Dense layer. This Dropout layer sets the dropout rate to 0.5, which means that half of the neurons in this layer will be randomly deactivated on each training iteration. This way, the model does not rely too much on a small number of neurons, but instead learns to distribute learning across the network.

Output Layer and Softmax Function

The output layer is used to perform classification into malware classes. This layer consists of a number of neurons equal to the number of malware categories in the dataset, and uses the Softmax activation function. The Softmax function converts the output scores into probabilities that represent the likelihood that a particular input belongs to each malware class. .

Optimizer and Training Process

For the training process, we use the Stochastic Gradient Descent (SGD) optimizer with a learning rate of 0.01 and a momentum of 0.9. SGD was chosen to provide more stable and directional weight updates compared to Adam, especially on relatively large and complex datasets. The use of momentum helps accelerates convergence by preserving the direction of weight updates, thereby avoiding excessive oscillations along steep slopes.

Measurement Method

Maldeb Dataset has 2 types of classification, namely benign and *malware,* so that there can be four possible classification outputs as shown in Figure 1.

		Predicted label	
		Benign	Malware (Intrusion)
True label	Benign	TN	FP
	Malware (Intrusion)	FN	TP

Figure 3. Confusion Matrix

There are 4 possibilities shown in Fig. 3 can be explained as follows:

a. *True Negative* (*TN*)
   True negative measurement results indicate the number of benign tumors that can be correctly identified.
b. *False Negative* (*FN*)
   false negative measurement results show that the classification results are benign, even though what was identified was *malware* .
c. *True Positive* (*TP*)
   True positive measurement results show the number of *malware* that was correctly identified.
d. *False Positive* (FP)

false positive measurement results indicate *malware* when in fact what is identified is benign. The four possible classification outputs are used to measure the model performance consisting of accuracy, precision, TPR (*Recall*) and F1- *score* with the following formula:

$$\text{Accuracy} = \frac{TP+TN}{TP+TN+FP+FN} \tag{1}$$

$$\text{Precision} = \frac{TP}{TP+FP} \tag{2}$$

$$TPR = \frac{TP}{TP+FN} \tag{3}$$

$$F - Score-= 2 \times \frac{Precision \times TPR}{Precision+TPR} \tag{4}$$

Accuracy (1) is the ratio of correctly identified malware. Precision (2) is the relevance in identifying *malware from the clarification results given by the output* . *True Positive Rate* (TPR) or recall (3) is the ratio of the success rate in identifying *malware* . *F-score* (4) is the accuracy rate calculated based on the precision and recall of a test.

RESULTS AND DISCUSSION

This experiment was conducted using the VGG16 model with variations of epochs (100, 250, 500) and optimizers (Adam, SGD) to detect malware. The results are shown in table 1.

Table 1. Experiment Result

Optimizer	Epoch	Precision	Recall	F1-Score	Accuracy
Adam	100	93	76	84	85
Adam	250	92	76	84	84
Adam	500	94	76	84	86
SGD	100	94	71	81	82
SGD	250	88	67	76	78
SGD	500	88	67	77	79

Adam Optimizer
The model trained with Adam showed consistent results and tended to be better than SGD across a range of epochs. At 100 epochs, the model with Adam

optimizer produced a precision of 93%, a recall of 76%, an F1-score of 84%, and an accuracy of 85%. This shows that the model is quite good at detecting malware accurately with few false positives or false negatives.

At 250 epochs, precision drops slightly to 92%, but recall remains stable at 76%. This results in a stable F1-score of 84 and a slight decrease in accuracy to 84%. This slight decrease is likely due to slight overfitting after a higher number of epochs.

At 500 epochs, precision has increased again to 94%, with recall remaining at 76%. However, the F1-score remains at 84, and accuracy has increased slightly to 86%. Adam seems to be quite stable in maintaining good performance even over longer training periods.

SGD Optimizer

The model trained using the SGD optimizer showed more varied results with performance that tended to be lower than Adam, especially in terms of recall. At 100 epochs, the model trained with SGD showed the same precision as Adam, which was 94%, but the recall was lower at 71%. This indicates that although the model was quite good at identifying detected malware, there were many cases of malware that were not detected (many false negatives). As a result, the F1-score dropped to 81, with an accuracy of 82%.

At 250 epochs, the model performance with SGD began to decline. Precision dropped to 88%, while recall remained low at 67%. The F1-score also dropped to 76, and accuracy only reached 78%. This decline may be due to SGD's inability to optimize the model more effectively as the number of epochs increases.

At 500 epochs, the downward trend continues. Precision remains at 88%, and recall does not improve, remaining at 67%. The F1-score and accuracy are at 77 and 79%, respectively, indicating that even though the model has been trained longer, its performance has not improved significantly and tends to be worse than Adam.

From these results, it is clear that the Adam optimizer is superior to SGD in terms of overall performance. Adam is able to maintain stable performance even when the number of epochs increases, while SGD tends to decrease in performance as the number of epochs increases. This may be due to Adam's adaptive ability to adjust the learning rate based on the gradient, allowing it to achieve faster and more stable convergence.

In contrast, SGD is more sensitive to the number of epochs and tends to get stuck in local minima or have difficulty optimizing the model properly. Although SGD has high precision values at the beginning of training, low recall indicates that the model often fails to detect malware, which in real-world scenarios can be fatal.

The low recall performance of SGD is a serious concern in malware detection applications. In security cases, errors in detecting malware (i.e., false negatives) are more harmful than false positives. Therefore, optimization with Adam is

more recommended for these malware detection tasks because it offers a better balance between precision and recall.

CONCLUSION

Based on the results of this experiment, it can be concluded that the Adam optimizer provides more stable and better performance compared to SGD in detecting malware using the VGG16-based transfer learning model. With higher precision, recall, F1-score, and accuracy, Adam is able to handle the overfitting problem better and offers better generalization to the validation data. In contrast, SGD shows less than optimal performance, especially in terms of recall, indicating that the model often fails to detect malware well. In malware detection, the use of the Adam optimizer is more recommended because of its ability to maximize detection and reduce false negatives .

REFERENCES

Firdausi, I., Lim, C., Erwin, A., & Nugroho, AS (2010). Analysis of machine learning techniques used in behavior-based malware detection. *Proceedings - 2010 2nd International Conference on Advances in Computing, Control and Telecommunication Technologies, ACT 2010* , 201–203. https://doi.org/10.1109/ACT.2010.33

Gibert, D., Mateu, C., Planes, J., & Vicens, R. (2018). Classification of malware by using structural entropy on convolutional neural networks. *Proceedings of the 30th Innovative Applications of Artificial Intelligence Conference, IAAI 2018* , 7759–7764. https://doi.org/10.1609/aaai.v32i1.11409

Gibert, D., Mateu, C., Planes, J., & Vicens, R. (2019). Using convolutional neural networks for classification of malware represented as images. *Journal of Computer Virology and Hacking Techniques* , *15* (1), 15–28. https://doi.org/10.1007/s11416-018-0323-0

July, S., & Ismail, I. (2024). MalSSL — Self-Supervised Learning for Accurate and Label-Efficient Malware Classification. *IEEE Access* , *12* (March), 58823–58835. https://doi.org/10.1109/ACCESS.2024.3392251

Kalash, M., Rochan, M., Mohammed, N., Bruce, NDB, Wang, Y., & Iqbal, F. (2018). Malware Classification with Deep Convolutional Neural Networks. *2018 9th IFIP International Conference on New Technologies, Mobility and Security, NTMS 2018 - Proceedings* , *2018 - January* , 1–5. https://doi.org/10.1109/NTMS.2018.8328749

Le, Q., Boydell, O., Namee, B. Mac, & Scanlon, M. (2018). Deep learning at the shallow end: Malware classification for non-domain experts. *Proceedings of the Digital Forensic Research Conference, DFRWS 2018*

USA , *26* , S118–S126. https://doi.org/10.1016/j.diin.2018.04.024

Rathore, H., Agarwal, S., Sahay, S. K., & Sewak, M. (2018). Malware detection using machine learning and deep learning. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* , *11297 LNCS* , 402–411. https://doi.org/10.1007/978-3-030-04780-1_28

Salas, M.I.P., de Geus, P.L., & Botacin, M.F. (2023). Enhancing Malware Family Classification in the Microsoft Challenge Dataset via Transfer Learning. *ACM International Conference Proceedings Series* , 156–163. https://doi.org/10.1145/3615366.3615374

THE PROFILE ANALYSIS OF SCIENTIFIC LITERACY' PROSPECTIVE ELEMENTARY TEACHER AS AN INITIAL STRATEGY TO CONDUCT SCIENCE COURSES

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ABSTRACT

Scientific literacy is one of the most important aspect students should have, either for now or in the future. Related to educational challenges of the 21st century, this literacy is actually needed to help students in taking decision when they try to solve any problem in any field, understand all the context of changes that probably occurred in society. According to PISA results in 2022, scientific literacy of students in Indonesia was categorized as low. Educational institutions have responsibilities to improve the quality of education, including students' scientific literacy. Teachers who have good scientific literacy are expected to offer some contributions in improving students' scientific literacy as well. This research was conducted to analyze the scientific literacy of prospective elementary teachers. Descriptive qualitative method was used, involving 120 students, called as prospective elementary teachers, as research subjects. The data was taken by giving test of scientific literacy using eight indicators of Gormally. questionnaire of students' learning history, and interview to some research subjects. Furthermore, the data analysis used in this research was inductive technique using Miles and Huberman Model, consisted of several steps; collecting, reducing, displaying, and verifying data as final steps to the conclusion. The result of this research was scientific literacy of prospective elementary teacher still categorized as moderate since the average score was 47,5 with range score around 27 until 63 in each indicator. This result indicated that the lecturer may consider some learning strategies where science process skill of students could be well-developed, integrate science and mathematics courses, engage students in more scientific reading, and together with institutions provide good maintenance in learning facilities.

Keywords: *scientific literacy, prospective elementary teacher, science courses*

INTRODUCTION

Scientific literacy is the ability to use scientific knowledge to understand the world around us. It involves asking questions, finding answers, explaining scientific phenomena, and drawing conclusions based on facts in reality (Jamilah, Astuti, Y.P. & AR., 2023). This skill helps to make informed decisions and participate in a society that relies on science and technology (Kähler et al., 2020). Scientific literacy is important for students as it helps them solve problems, understand societal changes, and prepare for the future. As stated by the World Economic Forum (2015), developing scientific literacy early on can equip individuals with the skills they need to succeed in the 21st century.

The rapid advancements in science and technology are driving the need for improved scientific literacy (OECD, 2018). However, recent global studies, such as PISA 2022, have shown a decline in students' scientific literacy. Indonesia, in particular, experienced a significant 13-point drop in its PISA score, falling behind the global average. While Indonesia did improve its overall ranking, it is clear that Indonesian students still struggle with scientific skills like identifying scientific claims, finding reliable information, analyzing data and drawing conclusions, and the last is using data to solve problems and make predictions (Rahmadani et al., 2018). The unexpected results of the PISA 2022 test were a wake-up call for Indonesia' education system. Schools need to improve the quality of education, especially in science. Adults, especially teachers, play a crucial role toguide students through experiments, answer their questions, and explain scientific concepts in simple ways. By doing this, teachers can help students develop a strong foundation in science and prepare them for the future learning (Bosse, S., Jacobs, G. & Anderson, 2019).

Universities, specifically through elementary teacher education programs (PGSD), are responsible in training prospective teachers who are scientifically knowledgeable and skilled in improving the scientific literacy of their students. Based on data, PGSD students of Perjuangan University come from various and different backgrounds which is unrelated to science education. This diversity leads to varying levels of scientific literacy, which can hinder the learning process. Over the past two years, both lecturers and students have encountered challenges such as differences in prior scientific knowledge, ineffective teaching strategies, student difficulties in independent learning, negative perceptions of science, and inconsistent evaluation standards. To address these issues and create a more equitable learning environment, a structured and systematic approach to teaching science courses is necessary. Based on those contexts above, the research about the profile analysis of prospective elementary teacher' scientific literacy in PGSD Perjuangan University was

conducted to determine the possible strategies held by lecturer in science courses.

METHODS

This research is aimed to analyze the scientific literacy of prospective elementary teachers. It went through six main steps starting by case study and problem identification, collecting relevant materials, defining research method and instruments, collecting research data, analyzing and interpreting data, and ended by drawing the conclusions. It actually was conducted by using descriptive qualitative method which is an inquiry strategy that emphasize value, definition, concept, characteristic, symptom, symbol, and description of a phenomenon by using some different methods, focusing on the quality, in the natural and holistic way, presented narratively (Yusuf, 2014). This research involved 120 first year-students of PGSD Perjuangan University, called as prospective elementary teachers, as research subjects. The data was taken by giving test of scientific literacy which refers to Test of Science Literacy Skills (TOSLS) by Gormally (Gormally et al., 2012), questionnaire of students' learning history, and interview to some research subjects related to their scientific literacy test' result. The scientific literacy test used in this research was developed based on eight indicators and was validated by expert before implemented to the research. The question distribution of scientific literacy test in this research instrument are presented below in Table 1.

Table 1. Question Distribution of Scientific Literacy Test

Indicator	Number of questions
Understand methods of inquiry that lead to scientific knowledge	
Identify a valid scientific argument	21, 22, 23, 24
Evaluate the validity of sources	25, 26, 27, 28
Evaluate the use and misuse of scientific information	29, 1, 2, 3
Understand elements of research design and how they impact scientific findings/conclusions	4, 5, 6
Organize, analyze, and interpret quantitative data and scientific information	
Create graphical representations of data	7, 30
Read and interpret graphical representation of data	8, 9, 10, 11
Understand & interpret basic statistics and solve problems using quantitative skills, including probability and statistics	12, 13, 14, 15, 16
Justify inferences, predictions, and conclusions based on quantitative data	17, 18, 19, 20

Another instrument which is the questionnaire of students' learning history was distributed to collect some information which possibly affect students' scientific literacy. As well as questionnaire, interview to some subjects was done to confirm what students have experienced thus far until they are here as prospective elementary teacher.

The after step was data analysis which is the main step lead to the research conclusion. This process was done before data collection, during data collection, and after data collection. Furthermore, the data analysis used in this research was inductive technique, applying Miles and Huberman Model. It actually compared the literature review and the specific factors appearing in this research to draw general conclusion (Umar, 2019). Figure 1. shows the scheme of data analysis of this research.
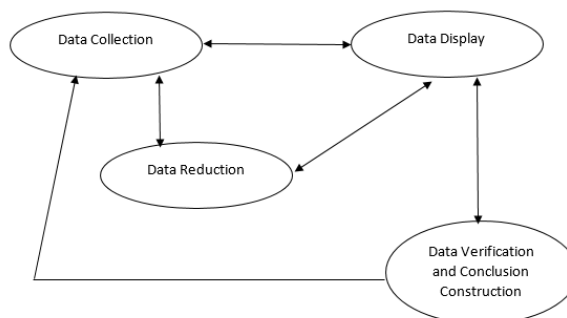
Figure 1. The Scheme of Data Analysis

RESULTS AND DISCUSSION

The scientific literacy of future prospective elementary teachers at Perjuangan University was assessed using a multiple-choice test based on Gormally's eight indicators. The average score was 47.5, which is considered moderate. None of the indicators reached a high level, as the minimum score for a high category is 67. These results suggest that the scientific literacy of these future teachers needs significant improvement. Figures 3 and 4 provide a detailed breakdown of their performance on each indicator.
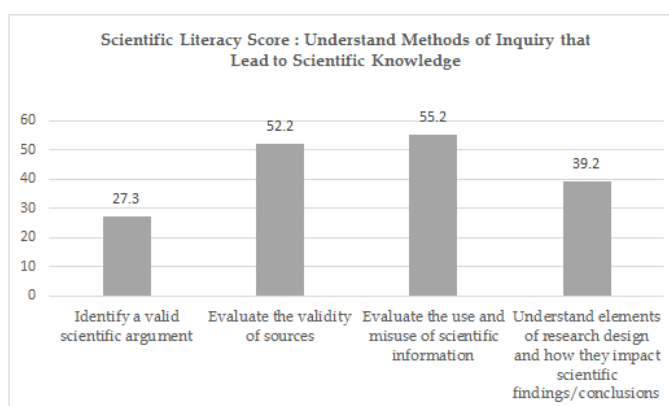
Figure 3. Average Score of Scientific Literacy in Indicator 1 until Indicator 4

Identify a valid scientific argument

The average score for this indicator is 27,3 and categorized as low. The low score in scientific argumentation is likely due to a lack of experience in scientific activities. Almost half of the students reported that their schools lacked proper labs, which limited their opportunities to participate in hands-on learning. This lack of practice can make it difficult for students to understand scientific phenomena and develop reasoning skills. Involving students in scientific argumentation give some benefits such as stimulating students' motivation in learning, supporting cognitive abilities, enhancing student performance, and developing critical thinking (Faize, F. A., Husain, W., & Nisar, 2017). Considering this context, a strategy that lecturers can implement to improve students' scientific argumentation skills is using argumentation models and linking science to the daily experiences to help students practice critiquing arguments, defending their claims, and presenting high-quality arguments.

Evaluate the validity of sources

According to the result in scientific literacy test, this indicator gained average score as much as 52,3 and categorized as moderate. The results indicated a common issue among students which is their difficulties in distinguishing between reliable and unreliable sources of information. A research claimed that students with a bit low knowledge are more likely to trust poor sites and fail to define the relevancy criteria when judging the trustworthiness of sources (Braten I, Stromso HI, 2011). This can lead to the misconceptions and invalid theories. Based on those analysis, lecturers can take the following steps such as introduce students to reliable sources, pursue them to identify scientific journals and other credible sources of information, and even encourage them to reading by assigning reading projects. Reading is a crucial skill that can benefit students in many ways. It can help them in develop critical thinking skills by analyzing information and forming their own opinions, improve problem-solving abilities by applying knowledge to real-world situations and enhance creativity by exploring new ideas and perspectives (Bradley & Wallace, 2008)).

Evaluate the use and misuse of scientific information

This indicator gained average score as much as 52,2 and it is in moderate category. The use and misuse of scientific information refers to recognizing a valid and ethical scientific action and identifying appropriate use of science to make societal decisions (Gormally et al., 2012). Scientific information processing actually could be implemented through some learning strategies such as approach, model, and method which involve students in some cases and

problem (Amar, G. I., Suranto, S., & Sajidan, 2020). It means, case study, project, and problem-based learning may be way more effective and efficient to be applied by lecturer as new learning experiences and innovations to the students. Regarding to the result of questionnaire, 43% of students have their own passion in science, 54% stated that they are not really into science, and just 3% of them having no passion at science at all. This kind of result could be a good input for lecturer conducting science courses due to their interests.

Understand elements of research design and how they impact scientific finding

This indicator states the ability of students to understand how a research could be designed and held by themselves. The average score is 39,2 and categorized as moderate. This number might be affected by some learning experiences they have pass through during school, for example when they had some laboratory works and experiments. Based on data of questionnaire, students coming from science major is about 29%, it means that possibly they often had laboratory activities, while other students did not. In the laboratory activities, students are invited to learn and observe phenomena, identify variables, classify and measure objects, use numbers, hypothesize the possibility, conclude the result, and communicate the object being studied (Kızılaslan, 2019; Kruea-In, C., Kruea-In, N., & Fakcharoenphol, 2015). When students have not been experienced this, they might be having difficulties in understanding element of research design and how to proceed it into findings. The lecturer could engage students in some laboratory works or any learning model or method that develop students' science process skill. According to Husna et al.(2022), science process skills is an investigative skill which allow and enhance students to design and carry out research.

Another result of scientific literacy indicators are shown in Figure 4 below.
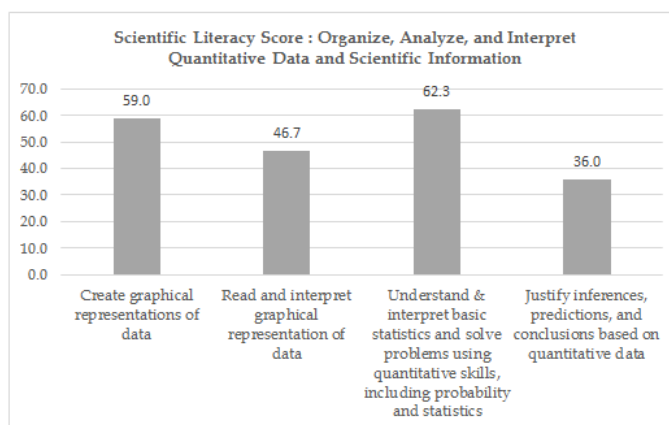
Figure 4. Average Score of Scientific Literacy in Indicator 5 until Indicator 8

Create graphical representation of data

The average score for this indicator is 59, which is considered moderate. Yet, unfortunately, this number refers to students are only moderately good at choosing the correct graph type for given data. While they can do this somewhat well in multiple-choice tests, they struggle when asked to create a graph themselves. Only 10% of students could do this, suggesting they lack the basic understanding of how to construct a graph, including the use of x and y axes. This case is likely linked to a weak foundation in basic mathematics. To address this, the lecturer could integrate mathematical concepts into science lessons using a scientific process skill approach or vice versa. This approach actually can enhance students' learning experience and improve their performance in both science and mathematics (Berlin & Lee, 2005)..

Read and interpret graphical representation of data

The average score for this indicator is 46.7, which is considered moderate. This means that students have a moderate ability to draw conclusions from data presented in graphs. The goal of this indicator is students are able to make conclusion of a study findings through a graph (Gormally et al., 2012) and to note what changes and what information are revealed by the manipulations and to identify the changing role of axes and to plot elements from graph to graph (Bright, G. W., & Friel, 1998; Garfield & Ooms, 2015). Yet, over half of the students struggle with reading and interpreting graphs. This issue can be addressed by providing more opportunities for students to practice these skills. One effective approach is to have students manipulate data between different graph types, observing how the changes in representation affect the information conveyed. This practice can help students develop a deeper understanding of graphs and improve their ability to draw meaningful conclusions from data.

Understand & interpret basic statistics and solve problems using quantitative skills

The average score for this indicator is 62.3, which is the highest among all indicators and is considered moderate. This ability is linked to basic mathematical knowledge. To improve this skill, integrating science and mathematics can be beneficial. This integration allows students to apply mathematical concepts to real-world scientific problems. By working together, science and mathematics lecturers can create projects that enhance students' understanding of both subjects. This integrated approach can facilitate better connections between concepts, processes, and skills across different subjects. It can lead to more meaningful learning and a deeper understanding of how mathematics and science are interconnected. Additionally, collaborative learning can help students overcome individual shortcomings and support the

development of better practices in both subjects (Rennie, L., Venville, G., & Wallace, 2012). Therefore, it is recommended that science and mathematics lecturers collaborate to update their curricula and integrate their courses to better develop students' skills in this area.

Justify inferences, predictions, and conclusion based on quantitative data

The average score of this indicator is 36, which is the second lowest score among all indicators. This ability may help students in making logical hypothesis, taking decision of cases, recognizing flaws in arguments, and evaluating solution of problem (Gormally et al., 2012). Enhancing this indicator, the lecturer may involve students in learning that using science process skills approach. This kind of approach involve students in some activities, like observation, measurement, classification, taking data, that possibly enactive them to do inference, prediction, and defining conclusion. Some researcher stated that science process skill may support the science inquiry of students (Juhji, 2016; Kruea-In, C., Kruea-In, N., & Fakcharoenphol, 2015). Besides that, Komikesari (2016) and Nugraha, et. al. (2019) stated that science process skill is the foundation to form logical thinking abilities of someone which describe their ways of thinking through scientific investigation or experimentation. Then, it could be claimed that science process skills are one of the most important aspects to be improved in the science courses as it helps students to be able to produce concepts, theories, and principles as well as justify inferences, prediction, and conclusion based on quantitative data (Adriyawati, U., Rahmawati, Y., & Mardiah, 2020; Pratono, A., Sumarti, S.S., Wijayati, 2018).

CONCLUSION

Based on the result of this research, it may concluded that the scientific literacy of prospective elementary teacher in PGSD Perjuangan University is still categorized as moderate, with the average score is equal to 47,5. Some aspects were considered as the reason why this number of scientific literacy attained, such as students' learning history and background, lack of experience in scientific laboratory activities or else which consider students' science process skill, teaching style of teacher, HOTS or PISA-typical question experience, students' interest in science, and even school facilities to support science learning. This result indicates that scientific literacy of PGSD students should be improved in term of the quality of graduates as elementary teacher in the future. Some efforts could be strategized by science lecturer to facilitate students in improving their scientific literacy. The initial strategy that may be conducted in science courses such as facilitating students in learning process that support their development in science process skill, include reasoning and argumentation skill, like having experiment, laboratory works, and application

of modern teaching and learning model. These effort are expected to increase their interest of science. Other strategies such as the integration of science and mathematics course where both lecture could do some collaboration in update the curricula to achieve this goal, engaging students in more scientific reading for example through scientific journal, and even good maintenance in learning facilities.

ACKNOWLEDGEMENT

REFERENCES

Adriyawati, U., Rahmawati, Y., & Mardiah, A. (2020). STEAM-project-based learning Integration to Improve elementary school students' scientific literacy on alternative energy learning. *Universal Journal of Educational Research*, *8*(5), 1863–1873. https://doi.org/https://doi.org/10.13189/ujer.2020.080523

Amar, G. I., Suranto, S., & Sajidan, S. (2020). The Use of a Creative Problem Solving Based Genetic Mutation Module in Higher Education. *International Journal of Higher Education*, *10*(3), 33. https://doi.org/https://doi.org/10.5430/ijhe.v10n3p33

Berlin, D. F., & Lee, H. (2005). Integrating Science and Mathematics Education: Historical Analysis. *School Science and Mathematics*, *105*(1), 15–24. https://doi.org/10.1111/j.1949-8594.2005.tb18032.x

Bosse, S., Jacobs, G. & Anderson, T. L. (2019). Young Children. *Science in the Air*.

Bradley, P., & Wallace, C. (2008). *Deep reading, cost/. 36*, 125–140.

Braten I, Stromso HI, S. L. (2011). Trust and mistrust when students read multiple information sources about climate change. *Learn Instr*, *21*, 180–192.

Bright, G. W., & Friel, S. N. (1998). *Graphical representations. In S. P. Lajoie (Ed.), Reflections on statistics: Learning, teaching and assessment in grades K-12*. Lawrence Erlbaum.

Chen, A., Darst, P. W., & Pangrazi, R. P. (1999). What constitutes situational interest? Validating a construct in physical education. *Measurement in Physical Education and Exercise Science*, *3*, 157–180. https://doi.org/doi:10.1207/ s15327841mpee0303_3

Faize, F. A., Husain, W., & Nisar, F. (2017). A Critical Review of Scientific Argumentation in Science Education. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(1), 475–483.

Garfield, J., & Ooms, A. (2015). *Using assessment items to study students ' difficulty reading and interpreting graphical representations of distributions. November.*

Gormally, C., Brickman, P., & Lutz, M. (2012). *Developing a Test of Scientific Literacy Skills (TOSLS): Measuring Undergraduates ' Evaluation of Scientific Information and Arguments. 11*, 364–377. https://doi.org/10.1187/cbe.12-03-0026

Husna, N., Halim, A., Evendi, E., Syukri, M., Nur, S., Elisa, E., & Khaldun, I. (2022). Impact of Science Process Skills on Scientific Literacy. *Jurnal Penelitian Pendidikan IPA*, *8*(4), 2123–2129. https://doi.org/10.29303/jppipa.v8i4.1887

Jamilah, Astuti, Y.P. & AR., M. . (2023). Implementation of the Campus Teaching Program Batch 3 in Building Scientific Literacy in Elementary Schools. *Jurnal Penelitian Pendidikan IPA*, *9*(7), 5140–5149.

Juhji, J. (2016). Keterampilan Proses Sains Siswa melalui Pendekatan Peningkatan Inkuiri Terbimbing. *Jurnal Penelitian Dan Pembelajaran IPA*, *2*(1), 58–70. https://doi.org/http://dx.doi.org/10.30870/jppi.v2i1.419

Kähler, J., Hahn, I., & Köller, O. (2020). The development of early scientific literacy gaps in kindergarten children. *International Journal of Science Education*, *42*(12), 1988–2007. https://doi.org/10.1080/09500693.2020.1808908

Kızılaslan, A. (2019). The development of science process skills in visually impaired students: Analysis of the activities. *International Journal of Evaluation and Research in Education*, *8*(1), 90–96. https://doi.org/https://doi.org/10.11591/ijere.v8i1.17427

Komikesari, H. (2016). Peningkatan keterampilan proses sains dan hasil belajar fisika siswa pada model pembelajaran kooperatif tipe student team achievement division. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *1*(1), 15–22. https://doi.org/https://doi.org/10.24042/tadris.v1i1.886

Kruea-In, C., Kruea-In, N., & Fakcharoenphol, W. (2015). *A Study of Thai In-Service and Pre-Service Science Teachers' Understanding of Science Process Skills. Procedia – Social and Behavioral Sciences. 197*, 993–997. https://doi.org/https://doi.org/10.1016/j.sbspro.2015.07.291

Nugraha, E.S., Hartono, Nuswowati, M. (2019). Improving science process skills through the sociocultural inquiry model. *Journal of Primary Education*, *8*(2), 192–199. https://doi.org/https://journal.unnes.ac.id/sju/index.php/jpe/article/view/25990

OECD. (2018). *PISA for Development Assessment and Analytical Framework: Reading, Mathematics and Science*. OECD Publishing.

Pratono, A., Sumarti, S.S., Wijayati, N. (2018). Contribution of assisted inquiry model of e-module to student science process skill. *Journal of Innovative Science Education*, *7*(1). https://doi.org/https://journal.unnes.ac.id/sju/index.php/jise/a

rticle/view/20633

Rahmadani, Y., Fitakurahmah, N., Fungky, N., Prihatin, R., Majid, Q., & Prayitno, B. A. (2018). Profil Keterampilan Literasi Sains Siswa di Salah Satu Sekolah Swasta di Karanganyar. *Jurnal Pendidikan Biologi*, *7*(3), 183. https://doi.org/10.24114/jpb.v7i3.10123

Rennie, L., Venville, G., & Wallace, J. (2012). *Integrating science, technology, engineering, and mathematics: Issues, reflections, and ways forward.* Routledge.

Umar, S. dan C. M. M. (2019). *Metode Penelitian Kualitatif di Bidang Pendidikan* (A. Mujahidin (ed.); 1st ed., Issue 0). CV. Nata Karya.

Yusuf, A. M. (2014). *Metode Penelitian: Kuantitatif, Kualitatif, dan Penelitian Gabungan*. Prenadamedia Group.

INTEGRATION OF LOCAL WISDOM VALUES OF LUBUK LARANGAN IN CIVIC EDUCATION LEARNING

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ABSTRACT

This article aims to analyze the potential integration of local wisdom values of Lubuk Larangan in Citizenship Education (PKn) learning. As a tradition of community-based resource management, Lubuk Larangan reflects various educational values, including mutual cooperation, social solidarity, ecological awareness, compliance with customary norms, and social justice. The study used a literature review method to analyze the relevance of Lubuk Larangan values to the concept of ecological citizenship, local wisdom-based learning, and the principles of Pancasila. The results of the analysis show that Lubuk Larangan can be a real example in building student character education, strengthening the relevance of PKn learning to the local context, and supporting the achievement of the Pancasila Student Profile dimensions. The integration of Lubuk Larangan in PKn learning can be done through a contextual, project, and value-based approach, which allows students to develop critical thinking skills, collaboration, and environmental awareness. In addition, this tradition can be used as a means to strengthen legal awareness and students' understanding of the importance of environmental sustainability. By presenting local wisdom of Lubuk Larangan in PKn learning, students not only gain conceptual understanding, but also real experience of the relationship between traditional values, customary law, and citizenship. This study recommends strengthening local wisdom-based curriculum, teacher training, and developing creative learning media to support this integration. These findings contribute to the literature on culture-based learning and the importance of strengthening citizenship education that is relevant to the local context.

Keywords: *local wisdom; ecological citizenship; educational values; customary norms; character education.*

INTRODUCTION

Local wisdom, as part of the culture that develops in society, has an important role in shaping character and social identity (Wulandari et al., 2023). In the Indonesian context, local wisdom not only reflects cultural richness but also contains values that can enrich learning in Citizenship Education (PKn). One of the local wisdoms that is relevant to study is Lubuk Larangan, a natural resource management system based on customary law that aims to preserve ecosystems and promote social justice in society. As a natural resource management practice typical of the Jambi community, Lubuk Larangan has become an integral part of the life of indigenous communities. In 2020, there were 197 Lubuk Larangan locations in 11 districts/cities in this province (Jufrida et al., 2020). This tradition reflects the ability of indigenous people to manage natural resources sustainably and in balance with the needs of future generations (Tamalene et al., 2014).

The values of local wisdom contained in Lubuk Larangan include mutual cooperation, social solidarity, and compliance with customary law norms. These values are in line with the principles of Pancasila, especially the third principle (Unity of Indonesia) and the fifth principle (Social Justice for All Indonesian People), which emphasize social justice and national unity. Lubuk Larangan can be a concrete example of how fair management of natural resources can create social solidarity while maintaining a balance between human interests and environmental sustainability (Bahar et al., 2023).

In civics learning, the integration of Lubuk Larangan values allows students to understand citizenship from a broader perspective, namely ecological citizenship. This concept emphasizes that every individual has rights and obligations not only to the state, but also to the environment (Dobson, 2003). Therefore, the integration of Lubuk Larangan values in civics learning can enrich students' understanding of the importance of customary norms, environmental law, and responsible citizenship.

METHODS

This study uses a literature review method to explore the integration of local wisdom values of Lubuk Larangan in Citizenship Education (PKn) learning. The literature review method aims to explore relevant information and theories from various academic sources, such as books, scientific journals, research reports, and policy documents. This approach allows researchers to identify, evaluate, and synthesize existing research results in order to build a strong conceptual foundation to support this article.

The literature review research method focuses on analyzing the content of sources related to local wisdom, citizenship education, and cultural

value-based learning theories. In this context, researchers review the main theories relevant to the topic, such as the concept of ecological citizenship, the values of mutual cooperation, and the approach to education based on local wisdom. Through this analysis, it is hoped that it can be identified how the values contained in Lubuk Larangan can be adapted into the Pancasila-based PKn curriculum.

RESULTS AND DISCUSSION

Identification of the Values of Lubuk Larangan

Lubuk Larangan is a form of local wisdom that contains various educational values rooted in the culture of indigenous peoples. As a community-based natural resource management system, Lubuk Larangan combines social, cultural, and ecological aspects, which are very relevant to be used as material in citizenship education. Identification of the values contained in Lubuk Larangan includes:

1. Mutual Cooperation and Social Solidarity

Formed through mutual agreement and managed collectively, Lubuk Larangan is real evidence of joint ownership of natural resources (Ilyas & Permatasari, 2018). Supervision of Lubuk Larangan is also carried out jointly by all members of the community, demonstrating a strong commitment to maintaining the sustainability of the aquatic ecosystem.

The practice of mutual cooperation in managing the forbidden pool is in line with the values of unity as stated in the third principle of Pancasila (Bahar et al., 2023). In the context of social solidarity, the forbidden pool reflects the active involvement of the community in establishing and implementing customary rules. Theoretically, mutual cooperation can be studied through the lens of communitarian ethics, which places collective values above individualism (Etzioni, 1993).

2. Ecological Awareness

The forbidden pool is a real example of ecological citizenship, which emphasizes individual and collective moral responsibility for environmental preservation (Dobson, 2003). This practice reflects the high awareness of indigenous peoples regarding the importance of maintaining ecosystem balance for the sustainability of future generations (Ilyas & Permatasari, 2018).

3. Compliance with Customary Norms

Etymologically, the forbidden pool consists of the word "lubuk" which refers to a deep part of the river, and "larangan" which indicates the existence of rules or restrictions (Suryahartati et al., 2020). The forbidden pool refers to an area along the river that is specifically managed by the local community based on customary law. The forbidden pool management system, which is rooted in local wisdom, designates certain water areas as conservation areas. This management principle is based on customary law that binds all members

of the community, where the community is required to comply with the norms that have been mutually agreed upon.

The proverb *"dimano bumi dipijak, disitu langit dijunjung, dimano tembilang dicacak disitu tanaman tumbuh, dimano air disauk disitu ranting dipatah,"* accurately describes the spirit of local wisdom that underlies the management of the forbidden pool, namely the importance of adapting to and respecting local customs (Suryahartati et al., 2020). The boundaries and management of this area are regulated in detail in customary agreements (Wulandari et al., 2023), with strict prohibitions on activities that damage the ecosystem and fishing outside the specified period. The sanction mechanisms that accompany these rules not only function as a means of social control (Parsons, 1951), but also as an effort to maintain environmental sustainability.

4. Social Justice and Sustainability

The distribution of the results of the Lubuk Larangan is based on the principle of social justice for all members of society. This is in accordance with the 5th principle of Pancasila, which emphasizes the importance of fair and equitable distribution. In addition, the sustainability of the Lubuk Larangan shows a balance between human needs and environmental sustainability (Lubis et al., 2021), supporting the concept of intergenerational equity (Rawls, 1999).

Relevance to Civic Education (PKn) Learning

The local wisdom values in Lubuk Larangan have great potential to enrich Civics learning. In particular, these values support several important aspects in character education, contextualization of Pancasila principles, and strengthening the ecological citizenship dimension.

1. Citizen Character Education

Values such as mutual cooperation, compliance with customary norms, and social justice can be used as a foundation in building students' character as ethical and responsible citizens. For example, mutual cooperation in Lubuk Larangan teaches students to work together in protecting the environment and solving community problems.

2. Contextualization of Pancasila Principles

Lubuk Larangan provides real examples of the application of the Pancasila principles in everyday life. For example, the third principle is seen in the spirit of community unity in maintaining this tradition, while the fifth principle is reflected in the practice of fair distribution of results. By discussing this relevance, students can understand that the values of Pancasila are not abstract but can be realized in real life.

3. Strengthening the Ecological Citizenship Dimension

In the modern era facing global challenges such as climate change, ecological citizenship education is becoming increasingly important. Lubuk Larangan can be used as a concrete model of how local communities maintain a balance between human interests and environmental sustainability. Through

project-based learning, students can be involved in activities that increase their awareness of environmental issues and ecological responsibility.

Integration Approach in Civic Education (PKn) Learning

Integration of the values of Lubuk Larangan in Civics learning provides a meaningful learning experience that connects the material with real contexts, in line with constructivist theory which emphasizes the importance of direct experience-based learning (Dewey, 1997). Three main approaches that can be applied include:

1. Contextual Approach

This approach links learning materials to students' real experiences, allowing for understanding of abstract concepts through the context of everyday life (Johnson, 2002). For example, students can analyze how Lubuk Larangan contributes to the social and economic well-being of the local community, thereby fostering social and environmental awareness.

2. Project-Based Learning

Involving students in solving real problems, this approach develops critical thinking, collaboration, and self-management skills (Rineksiane, 2022). In the context of Lubuk Larangan, students can design a model for managing natural resources based on local conservation, including identifying problems to solutions based on customary values.

3. Value-Based Learning

This approach helps students internalize moral and ethical values through analysis and practice (Halstead & Taylor, 2005). Class discussions can be directed at core values such as social justice, cooperation (Hamirul & Sunaryo, 2018), and environmental awareness (Hertati, 2021), which are relevant to building a sustainable society.

Contribution of Lubuk Larangan Local Wisdom to the Pancasila Student Profile

The local wisdom of Lubuk Larangan contributes to the achievement of the dimensions of the Pancasila Student Profile, as formulated by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. This contribution can be detailed as follows:

1. Faith and Devotion to God Almighty

The religious dimension in Lubuk Larangan is reflected through sacred customary rules, such as the prohibition of fishing at certain times to maintain the balance of nature. This value strengthens students' spiritual dimension by integrating religious teachings and local culture, so that students understand the importance of maintaining the relationship between humans, the environment, and God as a spiritual mandate.

2. Global Diversity

Learning Lubuk Larangan broadens students' horizons regarding the plurality of Indonesian culture, encourages appreciation for diversity, and

builds global awareness and tolerance (Sipuan et al., 2022). The values of cooperation, respect for customs, and environmental concern in this tradition teach the contribution of local culture to global issues such as environmental sustainability and social harmony.

3. Mutual Cooperation

The practice of mutual cooperation in Lubuk Larangan shows the importance of community collaboration in managing natural resources. This value can be adapted into project-based learning, where students are involved in simulations or environmental campaigns based on local wisdom. Through these activities, students learn social skills such as communication, shared decision-making, and empathy (Dewey, 1997).

CONCLUSION

Integration of local wisdom values of Lubuk Larangan in Civic Education (PKn) learning is important to strengthen character education, local relevance, and students' ecological awareness. Values such as mutual cooperation, ecological awareness, compliance with customary norms, and social justice are in line with the principles of Pancasila and can be a model for ecological citizenship-based learning. Contextual, project-based, and value-based approaches help students develop collective awareness, critical thinking, and collaborative skills. Thus, the integration of Lubuk Larangan not only enriches the PKn curriculum but also shapes students as ethical, environmentally conscious, and responsible citizens.

REFERENCES

Bahar, M., Wahyuni, A., & Saputra, M. A. (2023). *Educational Values in Lubuk Larangan Local Wisdom in Rantau Pandan Village , Bungo Regency , Jambi Province*. *15*(2), 999–1006. https://doi.org/10.37680/qalamuna.v15i2.3784

Dewey, J. (1997). *Democracy and Education*. Free Press.

Dobson, A. (2003). *Citizenship and the Environment*. Oxford University Press.

Etzioni, A. (1993). *The Spirit of Community: Rights, Responsibilities and the Communitarian Agenda*. Crown Publishers.

Halstead, J. M., & Taylor, M. J. (2005). *Values in Education and Education in Values*. Taylor & Francis.

Hamirul, & Sunaryo, J. (2018). LUBUK LARANGAN SEBAGAI SEBUAH NILAI (Suatu Studi tentang Nilai Gotong Royong). *SEMINAR NASIONAL PENDIDIKAN DAN KEWARGANEGARAAN*.

Hertati, R. (2021). *TINGKAT PARTISIPASI MASYARAKAT TERHADAP PENGELOLAAN LUBUK LARANGAN DI SUNGAI BATANG TEBO KABUPATEN BUNGO PROVINSI JAMBI. 2*(5), 5–8.

Ilyas, H., & Permatasari, B. (2018). *EKSISTENSI KEARIFAN LOKAL LUBUK LARANGAN SEBAGAI UPAYA PELESTARIAN SUMBERDAYA PERAIRAN DI DUSUN LUBUK BERINGIN KECAMATAN BATHIN ULU III KABUPATEN BUNGO*. *11*, 116–129.

Johnson, E. B. (2002). *Contextual Teaching and Learning: What It Is and Why It's Here to Stay*. Corwin Press.

Jufrida, Basuki, F. R., & Destinanda, A. (2020). ANALISIS DAN INTEGRASI KEARIFAN LOCAL LUBUK LARANGAN TANTANG SAKTI DALAM PEMBELAJARAN SAINS. *Jurnal Pendidikan Fisika*, *5*.

Lubis, T., Dardanila, Nasution, T., Zulkarnain, Hasrul, S., Ramlan, & Abus, A. F. (2021). Tradition Lubuk Larangan as a local wisdom for ecocultural tourism river management through landscape anthropolinguistic approach in Mandailingnese. *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/926/1/012029

Parsons, T. (1951). *The Social System*. Routledge & Kegan Paul.

Rawls, J. (1999). *A Theory of Justice*. Belknap Press.

Rineksiane, N. P. (2022). Penerapan Metode Pembelajaran Project Based Learning untuk Membantu Siswa dalam Berpikir Kritis. *JURNAL PENDIDIKAN MANAJEMEN PERKANTORAN*, *7*(1), 82–91.

Sipuan, Warsah, I., Amin, A., & Adisel. (2022). Pendekatan Pendidikan Multikultural. *Jurnal Ilmu Pendidikan Nonformal*, *08*, 815–830.

Suryahartati, D., Firya, O., & Windarto. (2020). *PENGETAHUAN TRADISIONAL DALAM HUKUM KEKAYAAN INTELEKTUAL (Belajar Ber-Hukum Dari Sebuah Tradisi Lubuk LaranganPada Masyarakat Adat Melayu Jambi)*. UNJA Publisher.

Tamalene, M. N., Muhdhar, M. H. I. Al, Suarsini, E., & Rochman, F. (2014). *The Practice of Local Wisdom of Tobelo Dalam (Togutil) Tribal Community in Forest Conservation in Halmahera, Indonesia*. *4*, 1–7. https://doi.org/10.5923/s.plant.201401.01

Wulandari, T., Kurniadi, M. D., Aldino, Arsih, F., & Lufri. (2023). *ANALISIS KONSERVASI KEARIFAN LOKAL LUBUK LARANGAN DESA BARU PUSAT JALO*. *23*, 72–76.

DETERMINING FACTORS OF WORK READINESS OF AGRICULTURAL VOCATIONAL SCHOOL STUDENTS

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ABSTRACT

The competition in the world of work is currently very tight, job seekers are not only competing with other job seekers but also competing with technology that has now replaced the role of humans in the industrial world. Vocational High School is a level of education that is prepared to produce graduates who are ready to work and prepare skilled workers in accordance with their fields of expertise. In line with that, Agricultural Vocational High Schools ideally produce graduates who are skilled and ready to work in the agricultural sector. The study was conducted with the aim of identifying the determinants of the work readiness of Agricultural Vocational High School students to work in the agricultural sector. The study was conducted at Agricultural Vocational High Schools in Ciamis Regency with a sample size of 132 students. The determinants of the work readiness of Agricultural Vocational High School students to work in the agricultural sector were analyzed using multiple linear regression. The results of the study showed that the variables of work motivation, career guidance, work interest, and spiritual intelligence had a significant effect on the work readiness of Agricultural Vocational High School students to work in the agricultural sector, both partially and simultaneously.

Keywords: *work readiness, agricultural vocational high school, students.*

INTRODUCTION

Agricultural Vocational High Schools prepare students to work in the agricultural sector (Alimudin et al., 2018). However, there are still students who are not ready to enter the world of work even though they have studied various abilities or competencies that are in accordance with their chosen majors (Miftahuddin & Robbani, 2023).

Work motivation affects work readiness because of the responsibility to do the job as well as possible in order to achieve optimal results (Maulanada et al., 2024). Career guidance has an important role in fostering students' maturity to think about their future orientation related to work readiness (Kurniawati & Arief, 2016). Job interest can provide a strong motivation for someone to be able to prepare themselves for work (Astuti et al., 2023). Spiritual intelligence is defined as intelligence that increases an individual's ability, capacity, competence, and skills (Wibowo & Febrianto, 2021).

This study was conducted with the aim of determining the effect of work motivation, career guidance, job interest, and spiritual intelligence on the work readiness of Agricultural Vocational High School students to work in the agricultural sector.

METHODS

The research method is a combination of qualitative and quantitative (Senjaya, 2018) with a survey approach (Maidiana, 2021). The research location was 4 Agricultural Vocational Schools in Ciamis Regency which provide agricultural expertise with a sample size of 132 students. Determining factors of work readiness of agricultural vocational school students are analyzed using multiple linear regression as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Where:
Y   = Work readiness
a   = Constant
X_1 = Work motivation
X_2 = Career guidance
X_3 = Work interest
X_4 = Spiritual intelligence
b_i = Regression coefficient

RESULTS AND DISCUSSION

Currently, there are still many Vocational High School graduates who have not been absorbed into the workforce due to their unpreparedness to compete in the workforce (Karlina et al., 2022). The high unemployment rate among vocational high school graduates is due to the fact that the quality required by the job market has not been achieved (Irawan & Hendri, 2022). In addition, there is a gap between the skills possessed by Vocational High School graduates and the skills required by the workforce (Listiani et al., 2023).

The determining factors of Vocational High School students' work readiness to work in the agricultural sector were analyzed using multiple linear regression equations as presented in table 1.

Table 1. Determining factors of work readiness of agricultural vocational school students

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

Constant	1.808	0.112		16.159	0.000*
Work motivation	0.069	0.020	0.126	3.552	0.001**
Career guidance	-0.074	0.027	-0.099	-2.761	0.007**
Work interest	-0.062	0.022	-0.101	-2.803	0.006**
Spiritual intelligence	1.808	0.027	.932	26.141	0.000*
Adjusted R Square	0.858				
F	199.156*				

Information:
Significant at α = 1%, ** significant at α = 5%
Source: Primary Data (2024)

Table 1 shows a determination coefficient of 0.858, indicating that the dependent variable is influenced by the independent variable by 85.8%, while the remaining 15.2% is influenced by other variables not included in the model. All independent variables have a significant effect on the work readiness of Vocational High School students to work in the agricultural sector, both simultaneously and partially.

The effect of work motivation on work readiness

Work motivation has a positive and significant effect on the work readiness of Vocational High School students to work in the agricultural sector. The results of this study are in line with the results of research by Novita & Armida (2022), Alifudin et al (2023), and Andina et al (2023).

Motivation has a very large influence on encouraging students to enter the world of work, thus creating their readiness to work (Ragil et al., 2024) because of the hope for a better future (Khoiroh & Prajanti, 2018). According to Ramadeni & Setyorini (2020), to prepare vocational school students to be able to enter the world of work, strong work motivation is needed which can encourage students to have the enthusiasm to enter the world of work.

The influence of career guidance on work readiness

Career guidance has a negative and significant effect on the work readiness of Vocational High School students to work in the agricultural sector. The results of this study are not in line with the studies of Zain et al (2020), Sura et al (2022), and Nugraha & Widarto (2017), which show that career guidance has a positive and significant effect on work readiness in graduates of Non-Agricultural Vocational High Schools.

Why does career guidance for Non-Agricultural Vocational High School students have a positive effect, while career guidance for Agricultural Vocational High School students has a negative effect? This can be explained by the fact that there is a decrease in the interest of the younger generation to work in the agricultural sector. According to (Hernowo et al., 2023), economically the younger generation considers working in the agricultural sector less promising. In addition, farming families encourage their children to work outside the agricultural sector (Oktafiani et al, 2021; Peka et al, 2022). More and more parents do not introduce agriculture to their children for

various reasons, for example, the income they receive is uncertain (Erliaristi et al., 2022), so they do not recommend their children to continue their work as farmers (Yamin et al., 2023).

The influence of work interest on work readiness

Work interest has a negative and significant effect on the work readiness of Vocational High School students to work in the agricultural sector. The results of this study are not in line with the studies of Trirachmawati & Suratman (2019), Sholihah & Astrella (2023), Sari et al (2019), Amalia & Murniawaty (2020), and Pratiwi et al (2020) which show that work interest has a positive and significant effect on work readiness in graduates of Non-Agricultural Vocational High Schools.

Why does the work interest of Non-Agricultural Vocational High School students have a positive effect, while the work interest of Agricultural Vocational High School students has a negative effect? This can be explained by the fact that there is a decline in the interest of the younger generation to work in the agricultural sector.

There are several factors that cause a decline in the interest of the younger generation in the agricultural sector, including: negative perceptions of agriculture, urbanization and modernization, limited access to resources, economic uncertainty Rozci & Oktaviani (2023), the agricultural sector has a less prestigious image with technology that is not yet advanced, and has not been able to provide adequate income. Arvianti et al (2019).

The influence of spiritual intelligence on work readiness

Spiritual intelligence has a positive and significant effect on the work readiness of Vocational High School students to work in the agricultural sector. The results of this study are in line with the results of research by Isyanto et al (2024).

Spiritual intelligence fosters new hopes for employee ethics, values, and productivity (Razi et al., 2024). Spiritual intelligence can help move a person's intellectual intelligence and emotional intelligence to be more active so that it is easier to generate positive emotions to carry out tasks optimally (Hidayah, 2019).

Someone who has spiritual intelligence understands the purpose of his life so that he always tries to improve his competence which has an impact on increasing work readiness (Isyanto et al., 2024).

CONCLUSION

The variables of work motivation, career guidance, work interest, and spiritual intelligence simultaneously have a significant effect on the work readiness of Vocational High School students to work in the agricultural sector, both simultaneously and partially.

ACKNOWLEDGEMENT

REFERENCES

Alifudin, P., Apriyanto, N., Fatra, F., & Fatimah, S. (2023). Pengaruh Praktik Kerja Lapangan dan Motivasi Kerja Terhadap Kesiapan Kerja Siswa. *Journal of Vocational Education and Automotive Technology*, *5*(1), 77-87.

Alimudin, I.A., Permana, P., & Sriyono. (2018). Studi Kesiapan Kerja Peserta Didik Smk Untuk Bekerja di Industri Perbaikan Bodi Otomotif. *Journal of Mechanical Engineering Education*, *5*(2), 179-185.

Amalia, P.I., & Murniawaty, I. (2020). Pengaruh Pendidikan Kewirausahaan, Efikasi Diri dan Minat Kerja Terhadap Kesiapan Kerja. *Economic Education Analysis Journal*, *9*(3), 907-922.

Andina, T., Kusuma, K.A., & Firdaus, V. (2023). Peran Efikasi Diri, Motivasi Kerja Dan Minat Kerja Terhadap Kesiapan Kerja Mahasiswa. *Management Studies and Entrepreneurship Journal* (MSEJ), *4*(6) 2023: 7844-7856.

Arvianti, E.Y., Masyhuri., Waluyati, L.R., & Darwanto, D.H. (2019). Gambaran Krisis Petani Muda di Indonesia. *Jurnal Sosial Ekonomi dan Kebijakan Pertanian*, *8*(2), 168-180.

Astuti, M.D., Nelwan, O.S. & Lumintang, G.G. (2023). Pengaruh Minat Kerja, Efikasi Diri dan Prestasi Belajar Terhadap Kesiapan Kerja Mahasiswa Manajemen Angkatan 2019 di FEB Unsrat Manado. Jurnal EMBA, *11*(4), 391-403.

Erliaristi, M., Prayoga, K., & Mariyono, J. (2022). Persepsi Pemuda Terhadap Profesi Petani Padi di Kota Semarang. *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisni*, *8*(2), 1387-1408

Hernowo., Sutanto, A., & Suyono. (2023). Kegiatan *On-Farm* dan *Off-Farm* Sebagai Usaha di Sektor Pertanian: Persepsi Pemuda di Kabupaten Purbalingga. *Jurnal Ekonomi Pertanian dan Agribisnis* (JEPA), *7*(2), 472-492.

Hidayah, R. (2019). Pengaruh Kecerdasan Spiritual Terhadap Kinerja Karyawan Melalui *Organizational Citizenship Behavior* pada PT PLN (Persero) Area Bojonegoro. *Jurnal Ilmu Manajemen*, *7*(1), 58-65.

Irawan, R., & Hendri. (2022). Analisis Kesiapan Kerja Siswa Sekolah Menengah Kejuruan Jurusan Teknik Instalasi Tenaga Listrik. *Jurnal Pendidikan Teknik Elektro*, *3*(1), 59-63.

Isyanto, A.Y., Fatimah, A.S., Sudrajat, & Amalia, L.N. (2024). Factors that Influence the Work Readiness of Agricultural Vocational High School Students to iork In the Agricultural Sector. *Rev. Gest. Soc. Ambient*, *18*(11), 1-9.

Karlina, N., Hedriana, H., & Supriatna, E. (2022). Studi Deskriptif Kesiapan Kerja Peserta Didik di SMK Negeri Cihampelas. *FOKUS: Kajian Bimbingan dan Konseling dalam Pendidikan*., *5*(1), 61-67.

Khoiroh, M., & Prajanti, S.D.W. (2018). Pengaruh Motivasi Kerja, Praktik Kerja Industri, Penguasaan *Soft Skill*, dan Informasi Dunia Kerja Terhadap Kesiapan Kerja Siswa SMK. *Economic Education Analysis Journal*, *7*(3), 1010-1024.

Kurniawati, A., & Arief, S. (2016). Pengaruh Efikasi Diri, Minat Kerja, dan Bimbingan Karir Terhadap Kesiapan Kerja Siswa SMK Program Keahlian Akuntansi. *Economic Education Analysis Journal*, *5*(1), 363-376.

Listiani, A., Wahono, P., & Wiradendi, C. (2023). Pengaruh Praktik Kerja Industri dan Bimbingan Karir Terhadap Kesiapan Kerja Siswa Kelas XII SMK Negeri 18 Jakarta. *Jurnal Pendidikan : Seroja*, *2*(3), 232-244.

Mahyuni. (2020). Hubungan Kecerdasan Spiritual dengan Motivasi Kerja Guru TK. *JURNAL EDUCHILD (Pendidikan & Sosial)*, 9(1), 38-45.

Maidiana, M. (2021). Penelitian Survey. *Alacrity: Journal Of Education*, *1*(2), 20–29.

Maulanada, A., Nurhidayah., & Hardaningtyas, R.T. (2024). Pengaruh Motivasi Kerja, Praktik Kerja Industri, dan Efikasi Diri terhadap Kesiapan Kerja Siswa SMK Negeri 4 Malang. *E-JRM : Elektronik Jurnal Riset Manajemen*, *13*(01), 770-781.

Miftahuddin, & Robani, M.F. (2023). Kesiapan Kerja Siswa SMK: Peran Kecerdasan Emosi, Future Time Perspective, dan Sikap terhadap Konseling Karier. *Jurnal Penelitian Psikologi*, *14*(2), 83–90.

Novita, D.I., & Armida. (2022). Pengaruh Pengalaman Praktek Kerja Industri dan Motivasi Kerja Terhadap Kesiapan Kerja Siswa. *Jurnal Ecogen*, *5*(1), 70-81.

Nugraha, H.D., & Widarto. (2017). Pengaruh Bimbingan Karir dan Praktik Kerja Industri Terhadap Kesiapan Kerja Siswa Teknik Pemesinan SMK Negeri 2 Pengasih. *Jurnal Pendidikan Vokasional Teknik Mesin*, *5*(1), 65-73.

Oktafiani, I., Sitohang, M.Y., & Saleh, R. (2021). Sulitnya Regenerasi Petani pada Kelompok Generasi Muda. Jurnal Studi Pemuda, *10*(1), 1-17.

Peka, M.A.U., Nampa, I.W., Nainiti, S.P.N. (2022). Persepsi dan Minat Pemuda Desa Pledo Terhadap Pekerjaan Sebagai Petani. *Jurnal EXCELLENTIA*, *XI*(1), 35-43.

Pratiwi, W., Supratman, O., & Rahayu, A. (2020). Pengaruh Minat Kerja dan Kemampuan Akademis Terhadap Kesiapan Memasuki Dunia Kerja

Mahasiswa Pendidikan Teknik Bangunan. *Jurnal Pendidikan Teknik Bangunan*, *2*(2), 75-88.

Purnama, S., Saldianto., & Ramadani, A.Z. (2024). Pengaruh Kecerdasan Spiritual, Budaya Kerja Terhadap Etos Kerja yang Dimediasi oleh Pengalaman Kerja. *Jurnal Muamalah*, *14*(2), 1-17.

Ragil, F., Irwanto., & Dwi, C.B. (2024). Pengaruh Kompetensi Keahlian, Motivasi Kerja, dan Praktik Kerja Industri Terhadap Kesiapan Kerja Siswa SMK. Jurnal Educatio, 10(4), 1137-1147.

Ramadeni, B.N., & Setyorini, D. (2020). Pengaruh Motivasi Kerja dan Pengalaman Praktik Kerja Lapangan Terhadap Kesiapan Kerja Siswa Kelas XII Akuntansi SMK Negeri 1 Yogyakarta. Kajian Pendidikan Akuntansi Indonesia, *9*(2), 1-10.

Razi, F., Amelia, A., Firdaus, S. (2024). Pengaruh Kecerdasan Emosional dan Kecerdasan Spiritual Terhadap Kinerja Pegawai pada Dinas Registrasi Kependudukan Aceh. *Improvement: Jurnal Manajemen dan Bisnis*, *4*(1), 11-16.

Rozci, F., & Oktaviani, D.A. (2023). Analisis Penyebab Menurunnya Minat dan Partisipasi Generasi Muda dalam Sektor Pertanian. *Jurnal Ilmiah Manajemen Agribisnis, Januari*, *11*(1), 48-56.

Sari, N.M., Indrawati, C.D.S., & Subarno, A. (2019). Pengaruh Praktik Kerja Industri dan Minat Kerja Terhadap Kesiapan Kerja Siswa SMK Negeri 1 Sukoharjo. *Jurnal IKRA-ITH Humaniora*, 3(3), 226-235.

Senjaya, A. J. (2018). Tinjauan Kritis Terhadap Istilah Metode Campuran (Mixed Method) Dalam Riset Sosial. *Risalah, Jurnal Pendidikan Dan Studi Islam*, *4*(1), 103–118.

Sholihah, M., & Astrella, N.B. (2023). Pengaruh Minat Kerja Terhadap Kesiapan Kerja Siswa SMK Negeri 2 Sukorejo. *AFEKSI: Jurnal Psikologi*, *2*(4): 285-295.

Sura, H., Mulyadi, & Halim, W.A. (2022). Pengaruh Bimbingan Karir Terhadap Kesiapan Kerja Siswa Jurusan Akuntansi di SMK 1 Enrekang. Edupsycouns Journal, *4*(1), 67-71.

Trirachmawati, D., & Suratman, B. (2019). Pengaruh Pengalaman Prakerin dan Minat Kerja terhadap Kesiapan Kerja Siswa Kelas XI SMKN 1 Jombang. *Jurnal Pendidikan Administrasi Perkantoran*, *07*(04) 137-141.

Wibowo, A., & Febrianto, R.A. (2021). Pengaruh Kecerdasan Spiritual dan Disiplin Terhadap Kinerja Guru di SD Al Firdaus Surakarta. *Edunomika*, *05*(01), 1-10.

Yamin, M., Lifianthi., & Ayuningsih, D.F. (2023). Analisis Minat Anak Petani Padi Menjadi Petani di Desa Pasemah Air Keruh Sumatera Selatan. *Jurnal Ilmiah Membangun Desa dan Pertanian* (JIMDP), *8*(2), 68-77.

Zain, N., Marsofiyati, & Ramadhanty, J. (2020). Pengaruh Efikasi Diri dan Bimbingan Karir Terhadap Kesiapan Kerja Siswa Kelas X dan XI SMK Negeri di Jakarta. *Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi* (JPEPA), *1*(1), 1-10.

Employment Outcomes of Information Systems Graduates: A Correlation Study on Job Search Timing, Income, and Institutional Influence

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ABSTRACT

This study examines the correlation between various factors—such as age, job waiting time, and initial salary—among alumni of the Information Systems program at the State University of Surabaya (UNESA) who graduated between 2022 and 2024. By analysing alumni tracer data, this research aims to uncover how these variables influence early career success and progression, offering insights into the factors that shape graduates' job market experiences. Key areas of focus include the relationship between alumni age and job search duration, the impact of job waiting time on starting salary, and how continuous skill development contributes to career advancement. Additionally, the study explores how initial salary correlates with job satisfaction, providing a deeper understanding of financial expectations and early career fulfilment. The findings are expected to inform UNESA's curriculum enhancements and support services by highlighting the educational experiences and career strategies that align with positive employment outcomes. Ultimately, this study aims to empower UNESA in delivering targeted alumni support and refining educational pathways that respond effectively to evolving industry demands, fostering sustainable career success and satisfaction among graduates.

Keywords: employment outcomes, correlation study, career success, job satisfaction, tracer study

INTRODUCTION

In today's rapidly evolving job market, universities face a significant challenge in aligning their curricula and teaching methodologies with the

dynamic demands of the workforce. Globalization and technological advancements have dramatically reshaped the employment landscape, creating an environment that requires graduates to possess both academic knowledge and practical skills relevant to their professional fields (Schwab, 2017). As an integral part of higher education, the Information Systems program at the State University of Surabaya (UNESA) is particularly tasked with preparing graduates for the highly competitive and skill-intensive information technology industry. With information systems graduates now entering a globalized market, it is essential to assess how effectively their education prepares them to meet such demands, especially given the ever-increasing expectations for adaptability, technical competence, and continuous learning (World Economic Forum, 2020).

The need to evaluate alumni career success and the role of educational effectiveness has grown in importance. Studies have shown that educational alignment with labor market needs significantly impacts career outcomes, as graduates who find a strong match between their studies and job requirements tend to have higher career satisfaction and progression rates (Brown et al., 2021; Jackson, 2018). Given this, an understanding of how education translates into real-world outcomes for graduates of UNESA's Information Systems program could inform further improvements in curriculum design, particularly in light of emerging trends in digital skills and workforce adaptability. Hence, this study seeks to assess the effectiveness of education in supporting alumni career success, focusing on correlations between alumni profile variables—such as age, job waiting time, initial salary, and continuous skill development—and career achievements.

The advancement of knowledge, particularly in information technology and exact sciences, has led to rapid changes in the competency requirements in the workforce. Therefore, higher education institutions, which are responsible for producing job-ready human resources, must continuously evaluate the learning processes within them. This evaluation is crucial for higher education institutions to minimize the gap between the demand for human resources that align with actual workforce needs in society.

In discussions about the quantitative relationship between the number of graduates and labor market demands, attention is focused not only on the total number of graduates and available jobs but also on the relationship between fields of study and job categories, which is referred to as educational relevance. The most prevalent concern is the mismatch between the competencies of graduates and the demands of the job market (Schomburg, H., & Teichler, U., 2007).

Ideally, education should align with workforce needs. Relevance in education refers to the connection between educational outcomes and societal needs (Nurgiyantoro, 2018). The concept of relevance consists of two parts: internal relevance and external relevance. Internal relevance refers to the consistency among curriculum components, such as objectives, content,

learning processes, and evaluation. In other words, internal relevance pertains to the alignment between components within the curriculum. Meanwhile, external relevance refers to the alignment between the curriculum and the demands, needs, and developments within society.

This study poses two primary research questions: 1) How successful are alumni in achieving their desired career goals? and 2) Is there a correlation between the examined profile factors and employment outcomes? Such inquiries align with the broader aim of understanding how demographic and professional factors intersect to influence career trajectories, providing evidence-based insights that can bridge the gap between academic training and labor market requirements (Cheng et. al, 2022). By focusing on Information Systems alumni from the 2022 to 2024 cohorts, this research aims to provide a detailed and contextually relevant view of early career development, exploring the impact of key factors on alumni job success through rigorous correlation testing.

This study's objectives include not only providing insights into the extent to which alumni have achieved their career aspirations but also examining whether alumni continue to develop relevant skills post-graduation to remain competitive in the labor market. It further seeks to capture alumni perceptions of how well their education aligns with job requirements, thus offering a clearer understanding of educational relevance in professional contexts. Analyzing correlations among demographic factors, employment roles, career progression, and other employment metrics will provide a nuanced view of these influences (Arthur et al., 2020).

Expected outcomes of this research include enhanced insights into the relevance of UNESA's Information Systems curriculum to industry needs, identification of areas where alumni may require further support in career development, and an enriched understanding of alumni expectations in the workforce. Ultimately, this study aims to provide actionable insights that enable UNESA to adapt its educational offerings and support services to meet the evolving demands of the industry, ensuring graduates are well-prepared for sustainable and fulfilling careers in information technology.

METHODS

This study employs a survey method with a correlation test approach to analyze alumni data, aiming to identify relationships between demographic variables of graduates and their employment factors. The primary focus of this research is to investigate the correlations between age, job waiting time, initial salary, and career progression with the competencies and values developed by the program, as well as the skills that need enhancement. The respondents in this study consist of graduates (alumni) of the Information Systems Program at the State University of Surabaya who completed their studies between 2022 and 2024.

This study applies a tracer study instrument designed by the University's Tracer Study Team. As such, this instrument serves not only as a measurement tool but also as a product of the development efforts conducted by the University's Tracer Study Team, with the researchers not directly involved in its development process. The research instrument consists of a structured questionnaire organized into three sections: general information about graduates, employment-related data, and evaluations of the learning or training experiences received by graduates.

To collect data from graduates, the tracer study instrument was distributed via the alumni platform available at alumni.unesa.ac.id. The questionnaire link was sent to registered alumni email addresses to facilitate access and participation. The tracer study instrument, as detailed in Appendix 2, serves as the primary data collection tool.

a. Hypotheses Development

H1: There is a correlation between the time an individual begins their job search and the waiting period to secure employment.

This hypothesis is grounded in theories that highlight how job-seeking timing and intensity impact employment outcomes. Job Search Theory (Faberman et al, 2022) posits that early job seekers are more likely to encounter job opportunities, which can reduce their waiting time to secure employment. Recent studies reinforce this view, suggesting that early and proactive job search behaviours are positively associated with reduced unemployment durations. For instance, a longitudinal study published in the *Journal of Vocational Behaviour* found that individuals with high job search self-efficacy and proactive behaviours often secure employment more quickly than those who delay (Wanberg et al., 2005). Additionally, research by J-PAL (2022) demonstrates that job search timing and approach significantly influence employment success, as early job search efforts improve visibility and align candidates better with market demands. These theories and findings collectively support the hypothesis that the timing of a job search is correlated with the duration it takes to obtain employment.

H2: There is a correlation between the number of applications submitted to institutions and the number of institutions responding to those applications.

This hypothesis is supported by theories and studies on job-seeking behaviours and application response rates. Job Search Theory suggests that the quantity of applications sent out is positively associated with response rates, as increased outreach expands the candidate's visibility and potential for employer engagement (Mortensen, 1986). By submitting applications to multiple

institutions, job seekers increase their chances of receiving responses, as the probability of a positive response typically rises with the number of applications.

Recent research supports this relationship. A study by Soffia, et al (2023) published in *Work, Employment, and Society* found that job seekers who applied to a larger number of positions reported higher response rates, attributing this to enhanced visibility and a broader network of potential employers. Additionally, a report from LinkedIn's Economic Graph (2023) revealed that candidates who apply widely tend to receive more responses, particularly in competitive job markets where high application volume improves the likelihood of securing employer interest. These findings support the notion that a higher number of applications correlates with an increased likelihood of responses from hiring institutions.

H3: There is a relationship between gender and job type.

This hypothesis is supported by various theories and studies that discuss the influence of gender on occupational choices and job type distribution.

Recent studies corroborate this relationship. For example, a study published in the *Journal of Economic Perspectives* (2021) highlights that gender continues to play a significant role in job selection, with evidence showing persistent trends in occupational gender segregation across various sectors. Additionally, a 2022 report from the International Labour Organization (ILO) showed that certain job types remain predominantly gendered due to both traditional expectations and organizational practices. These theories and studies collectively support the hypothesis that gender is associated with the type of jobs individuals pursue or are more likely to be employed in.

H4: There is a correlation between total income and the type of employing institution.

Recent studies reinforce these ideas. A report by the Bureau of Labor Statistics (2022) found that employees in private sector institutions often report higher average incomes than those in public sector roles, especially in fields like technology and finance. Similarly, a study in the *Journal of Labor Economics* (2021) showed that non-profit sector workers tend to earn lower total incomes than those in the private sector, often due to limited revenue streams and budget allocations. These theories and findings support the hypothesis that the type of employing institution correlates with variations in total income.

b. Data Collection and Processing

Data collected from the survey is processed using descriptive statistical methods to provide insights into alumni's employment status and employer expectations. The analysis covers variables such as the waiting period for graduates to secure employment, job relevance to their field of study, initial salary upon securing a job, and the alignment between skills acquired during study and those required in their current roles. This analysis aims to evaluate alumni success in achieving career goals, examine the frequency of skill development and career advancement, and assess whether alumni feel that their education was relevant to their careers.

c. Tools and Software

Data analysis is supported by Microsoft Excel and SPSS, which are utilized for data cleaning, transformation, and conducting statistical tests. Microsoft Excel provides an initial platform for organizing and preparing the data, while SPSS facilitates more complex statistical analysis, including the calculation of correlation coefficients to assess the relationships between variables.

RESULTS AND DISCUSSION

The aim of this study is to examine the results of a tracer study conducted on Bachelor's graduates in Information Systems from the State University of Surabaya over the past three years, specifically in 2021, 2022, and 2023. A total of 169 Bachelor's graduates in Information Systems completed the tracer study, with detailed findings outlined as follows.

### A. Alumni Demographics
1. Graduate Profile
Out of a total of 174 graduates from the years 2021–2023, 169 have completed the tracer study. Below is the profile of graduates based on gender and graduation year.
Of the 169 surveyed graduates, 120 (or 71%) are currently employed in government and private institutions. Meanwhile, six other graduates have chosen entrepreneurship, either continuing family businesses or starting their own ventures. Additionally, among the respondents, 43 (or 25%) are currently unemployed; four of them have decided not to seek employment as they are continuing their studies. The remaining 39 (or 23%) are unemployed but actively seeking work, or are unable to work at the moment due to family and parental responsibilities.
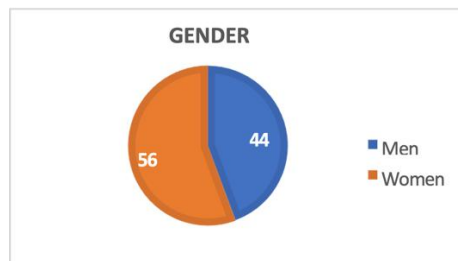
2. **Current Employment and First Jobs After Graduation**

Currently, graduates from the Information Systems program at UNESA are employed across various types of organizations, including government agencies, foundations, notary offices, private companies, hospitals, banks, startups, heavy equipment contractors in the mining sector, non-profit organizations, educational institutions, and entrepreneurial ventures. Graduates from UNESA's Information Systems program have been able to secure these positions thanks to their skills in information technology, knowledge, and work ethics.
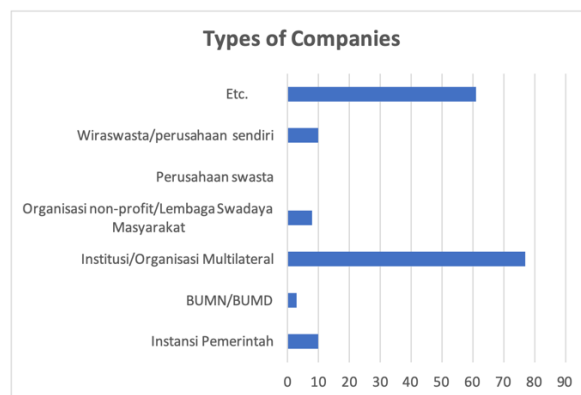
The relevance of the study program to the graduates' current jobs is illustrated in the figure below.
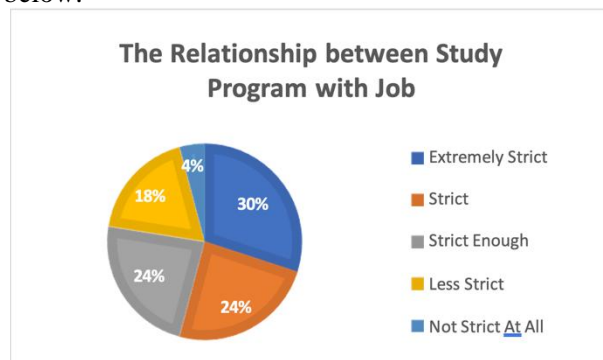
Based on the figure above, it is evident that the relationship between the study program and the jobs held by the majority of graduates is very strong, at 78%. The remaining graduates hold positions that are less related or even unrelated to the study program. Jobs with a very strong connection to the program include programmer, systems analyst, digital marketing, and UI/UX designer. Meanwhile, jobs with a lower level of relevance to the study program include administrative staff, operators, notary staff, and service staff.

3. **Job Search Duration and Time to Employment**

A total of 41 respondents, or approximately 34%, began their job search between 0-6 months before graduating. Meanwhile, 59 respondents, or around 50%, only started searching for a job 0-6 months after graduation. Data on the time required for respondents to secure employment is presented in the following table:

Duration	Frequency	Percentage
<= 6 months	109	91%
> 6 months	11	9%

From this table, it is evident that the majority of respondents, 91%, secured employment within 6 months of graduation, while the remaining 9% found jobs after more than 6 months.

4. **Monthly Income**

Income is a key motivator for new graduates, similar to others, which drives many of them to seek employment immediately after graduation. In this study, as shown in the table below, the gross monthly income of employed graduates ranges from Rp 2,000,000 to Rp 4,000,000, with the majority of respondents (42%) falling within this range. Additionally, 35% of respondents earn between Rp 4,000,000 and Rp 6,000,000, and 14% of respondents earn over Rp 6,000,000. The smallest proportion of respondents, only 9%, receive a gross monthly income below Rp 2,000,000. This represents a positive start for most respondents, as they are earning a monthly income between Rp 2,000,000 and Rp 4,000,000 in professional, technical, or supervisory positions, with some administrative roles also falling within this salary range. The number of graduates earning more than Rp 6,000,000 per month is still quite low, as they have not been employed long enough to achieve higher earnings in their companies.

5. **Emphasis on Learning Methods in the Study Program Perceived as Highly Useful for Graduates' First Jobs**

This study also assessed the extent to which the learning methods implemented in the Information Systems program at UNESA benefit graduates. Several learning methods used in the program include lectures, demonstrations, participation in research projects, internships, practical work, fieldwork, and discussions. The learning method rated by graduates as the most beneficial for their current jobs is shown in the table below.

Learning Method	No Benefit (1)	Low (2)	Moderate (3)	High (4)	Very High (5)	Total Score (Frequency multiplied)
Lectures	9	28	38	21	24	337
Demonstrations	10	40	29	25	16	363
Participation in Research Projects	14	28	36	25	17	357
Internships	22	26	23	18	31	350
Practical Work	13	28	36	21	22	349
Fieldwork	17	23	43	13	24	356
Discussions	16	20	23	39	22	329

6. Competencies Mastered by Graduates Compared to Competencies Considered Essential for Their First Jobs

In the analysis of graduate competencies, two results were obtained: the score of competencies mastered by graduates at the time of graduation and the score of competencies considered very useful for their first jobs. The results are presented in the table below.

Competency Mastered at Graduation	Total Score (Frequency Multiplied)	Essential Competency in First Job	Total Score (Frequency Multiplied)
Ethics	513	Ethics	556
Field-Specific Skills	476	Field-Specific Skills	502
English Language	446	English Language	466
Information Technology Usage	518	Information Technology Usage	540
Communication	493	Communication	551
Teamwork	515	Teamwork	551
Self-Development	507	Self-Development	532

Based on the scores multiplied by frequency for competencies mastered by graduates of the Information Systems program, IT usage skills were the most mastered, with a score of 518, followed by teamwork skills with a score of 515, and ethics with a score of 513. These three competencies represent the most mastered skills by graduates at the time of graduation. However, among the primary skills expected of Information Systems graduates, communication skills did not receive a high score, only reaching 493. Meanwhile, based on the scores multiplied by frequency for competencies considered very important by Information Systems graduates, there are three competencies with high scores:

ethics, communication, and teamwork, with scores of 556, 551, and 551, respectively.

From these two results, it can be concluded that graduates of the Information Systems program have mastered two out of the three competencies that are highly needed and useful in their jobs: ethics and teamwork. However, for communication skills, which are considered important in the workplace, graduates only scored 493 upon graduation. Nevertheless, one of the three most mastered skills by graduates at the time of graduation—information technology usage skills, with a score of 518—is very strong, as this skill is highly useful and needed by graduates who primarily work in fields closely related to the Information Systems program, such as programmers, systems analysts, digital marketing specialists, and UI/UX designers.
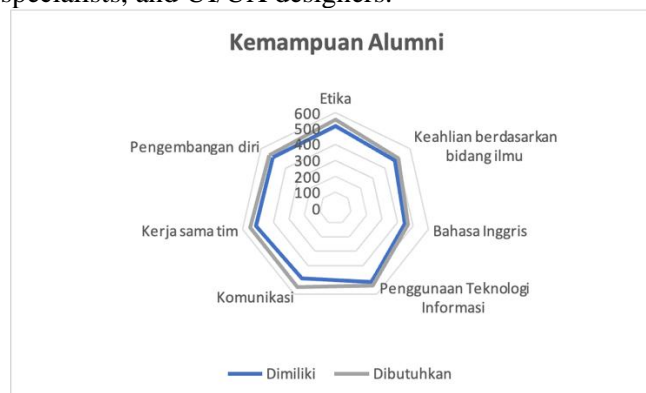
B. Correlation Testing

This testing was conducted using several types of correlation tests to determine the presence or absence of a correlation or relationship between two variables and to test the existing hypotheses. The data used in this test consisted of 120 respondents, who are alumni of the Information Systems program at UNESA, graduating in 2021, 2022, and 2023.

1. **Correlation Between Job Search Start Time (Ordinal) and Waiting Period to Secure Employment (Ordinal)**

This test was conducted using the Spearman correlation test, as both variables are ordinal data. Spearman's correlation is a non-parametric statistic, which means it does not require any assumptions about the normal distribution of the data being tested. The purpose of this test is to determine whether there is a correlation or relationship between the two variables. Additionally, this test was conducted to examine the following hypothesis:

H1: The sooner an individual begins their job search, the shorter the waiting period to secure employment.

For the variable representing the job search start time, coding was as follows: 1 for alumni who began job searching before graduation and 2 for alumni who started job searching after graduation. Below are the results of the correlation test between job search start time and the waiting period to secure employment:

Correlations			MULAI MENCARI PEKERJAAN	MASA TUNGGU DAPAT KERJA
Spearman's rho	MULAI MENCARI PEKERJAAN	Correlation Coefficient	1.000	.428**
		Sig. (2-tailed)	.	.000
		N	120	120
	MASA TUNGGU DAPAT KERJA	Correlation Coefficient	.428**	1.000
		Sig. (2-tailed)	.000	.
		N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).				

- Based on the output of the Spearman correlation test above, the significance value or Sig. (2-tailed) between the job search start time and waiting period is $0.000 < 0.05$. This indicates that there is a significant correlation between these two variables.
- Based on the correlation test results, the correlation coefficient between job search start time and waiting period is 0.428. Thus, the relationship between job search start time and waiting period can be categorized as "moderate."
- Based on the output table, the correlation coefficient between job search start time and waiting period is positive at 0.428. This indicates a "positive" relationship between the two variables, meaning that the sooner someone starts their job search, the shorter their waiting period to secure employment.

Therefore, according to the three interpretations from the Spearman correlation test above, it can be concluded that the relationship between job search start time and waiting period is **significant, moderate, and positive**. This means that the alternative hypothesis (H1) is accepted.

2. Correlation Between Number of Applications Submitted (Ordinal) and Number of Responses Received (Ordinal)

This test was conducted using the Spearman correlation test, as both variables are ordinal data. Spearman's correlation is a non-parametric statistic, meaning it does not require any assumptions about the normal distribution of the data being tested. The purpose of this test is to determine whether there is a correlation or relationship between the two variables. Additionally, this test was conducted to examine the following hypothesis:

H2: There is a correlation between the number of institutions applied to and the number of institutions responding.

Below are the results of the correlation test between the number of applications submitted and the number of responses received:

Correlations			INSTANSI YANG DILAMAR	INSTANSI YANG MERESPON
Spearman's rho	INSTANSI YANG DILAMAR	Correlation Coefficient	1.000	.851**
		Sig. (2-tailed)	.	.000
		N	120	120
	INSTANSI YANG MERESPON	Correlation Coefficient	.851**	1.000
		Sig. (2-tailed)	.000	.
		N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).				

- Based on the Spearman correlation test output above, the significance value or Sig. (2-tailed) between the number of applications submitted and the number of responses received is $0.000 < 0.05$. This indicates that there is a significant correlation between these two variables.

- Based on the correlation test results, the correlation coefficient between the number of applications submitted and the number of responses received is 0.851. Therefore, it can be concluded that the relationship between the number of applications submitted and the number of responses received is "very strong."

- Based on the output table above, the correlation coefficient between the number of applications submitted and the number of responses received is positive, at 0.851. This indicates a "positive" relationship between the two variables, meaning that the more applications submitted, the more responses received.

Therefore, based on the three interpretations from the Spearman correlation test above, it can be concluded that the relationship between the number of applications submitted and the number of responses received is significant, very strong, and positive. This means that the alternative hypothesis (H2) is accepted.

3. Correlation Between Gender (Nominal) and Job Type (Nominal)

This test was conducted using the Chi-Square correlation method, specifically the Phi correlation or Cramer's V coefficient. The Phi correlation is used to measure the strength of the relationship between two binary (dichotomous) variables. Binary variables are variables with only two categories (e.g., yes/no, male/female). Meanwhile, Cramer's V is used to measure the strength of the relationship between two categorical variables when one or both variables have more than two categories. Therefore, this test was conducted using the Chi-Square correlation method, specifically Phi or Cramer's V correlation, as the data being tested are nominal/categorical, meaning there is no inherent order or hierarchy, as is the case with gender.

In addition to determining whether there is a correlation between gender and job type, this test was also conducted to examine the hypothesis:

H3: There is a correlation between gender and job type.

In this correlation test, coding was applied to facilitate data processing using SPSS software. The gender variable was coded as 1 for male and 2 for female. For job type, coding was applied based on the relevance of the job to the study program, with 1 for "relevant" and 2 for "not relevant." Below are the results of the correlation test between gender and job type:

Symmetric Measures		Value	Approximate Significance
Nominal by Nominal	Phi	.339	.000
	Cramer's V	.339	.000
N of Valid Cases		120	

Based on the table above, it can be seen that the Approximate Significance (P-Value) is < 0.05, specifically 0.000, indicating that there is a significant relationship or correlation between gender and job type. The degree of relationship has a value of 0.339, meaning that the correlation between gender and job type is weak. This means that H3 is accepted.

The findings of this study provide valuable insights into the factors influencing the career trajectories of Information Systems graduates from UNESA. The significant, moderate, and positive correlation between early job search initiation and a shorter waiting period for employment highlights the advantage of proactive job-seeking behaviors (Lim & You, 2019). Graduates who began their job search prior to graduation tended to secure employment sooner, aligning with Job Search Theory, which suggests that early engagement in the job market increases exposure to opportunities (Lim & You, 2019). This result suggests that career services at universities could emphasize early job search strategies, potentially through internships or career fairs, to minimize post-graduation unemployment. Additionally, the strong correlation between the number of applications submitted and the response rate underscores the benefits of a broad job search strategy. Graduates who applied to more institutions received more responses, illustrating the importance of a high application volume to increase visibility and improve chances of securing job offers (van Hooft & Crossley, 2017). Universities might consider advising students on comprehensive application strategies that balance quality and quantity.

The weak correlation between gender and job type suggests that while some traditional gender associations may exist in specific roles, the field of Information Systems generally provides opportunities across gender lines (Silva, 2022). This finding may indicate a level of inclusivity in the field, though further exploration into potential implicit biases or barriers could ensure equal access to various job roles. The significant difference in income based on the type of institution emphasizes how institutional factors shape earning potential, with private sector roles often offering higher initial salaries due to competitive demand for skilled talent, while government and non-profit roles may prioritize benefits and job security over starting salary (Barros & Pereira,

2022). This finding is consistent with Labor Market Segmentation Theory, which explains how different sectors offer distinct compensation structures (Barros & Pereira, 2022). Universities could leverage this information by guiding students on realistic salary expectations across sectors, helping them make informed career choices.

Overall, these results reveal a complex interaction between job search behaviors, demographic factors, and institutional contexts in shaping employment outcomes. The findings suggest that career support programs should not only focus on skill development but also on effective job search strategies and realistic career planning. By encouraging proactive job engagement and providing insights into industry trends, universities can enhance the employability and career satisfaction of graduates in a competitive job market (Ho, et.al, 2023).

CONCLUSION

This study investigated several aspects related to the career paths of Information Systems graduates from the State University of Surabaya (UNESA) from 2021 to 2023. By analyzing the relationships between variables such as job search timing, job response rates, gender, job type, total income, and the type of institution, significant insights were gained about the graduates' employment outcomes and the factors influencing them.

Overall, the findings highlight that proactive job-seeking behaviors, such as starting the job search early and applying to multiple institutions, can positively impact employment outcomes. Additionally, the type of institution plays a role in determining income, and gender may have some influence on job type. These insights underscore the importance of preparing graduates not only with relevant skills but also with effective job-seeking strategies to enhance their success in the labor market.

REFERENCES

Arthur, M. B., Inkson, K., & Pringle, J. (2020). *The new careers: Individual action and economic change.* SAGE Publications.

Bakhtiar, M., & Latif, S. (2017). Tracer study alumni: Upaya pengembangan prodi bimbingan konseling Universitas Negeri Makassar. *Jurnal Kajian Bimbingan dan Konseling, 2*(1), 32–40. https://doi.org/10.17977/um001v2i12017p032

Grimshaw, D., Fagan, C., Hebson, G., & Tavora, I. (2017). A new labour market segmentation approach for analysing inequalities: introduction and overview. In *Making work more equal* (pp. 1-32). Manchester University Press.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education.* University of Chicago Press.

Blau, F. D., Brinton, M. C., & Grusky, D. B. (2006). *The declining significance of gender?* Russell Sage Foundation.

Brown, P., Lauder, H., & Cheung, S. Y. (2021). *The death of human capital? Its failed promise and how to renew it in an age of disruption.* Oxford University Press.

Silva, L., Sampaio, S., & MARINHO, M. (2022). Gender Diversity in Technology Sector: Barriers and Perceptions Success of Women in Porto Digital. In *WORKSHOP Proceedings http://ceur-ws. org ISSN* (Vol. 1613, p. 0073). sn.

Eagly, A. H., & Wood, W. (2012). Social role theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology: Volume 2* (pp. 458–476). Sage Publications.

Fajaryati, N., Pambudi, S., Priyanto, P., Sukardiyono, T., Utami, A. D. W., & Destiana, B. (2015). Studi penelusuran (tracer study) terhadap alumni program studi pendidikan teknik informatika jurusan pendidikan teknik elektronika fakultas teknik Universitas Negeri Yogyakarta. *Elinvo (Electronics, Informatics, Vocational Education), 1*(1), 44–45. https://doi.org/10.21831/elinvo.v1i1.10878

International Labour Organization. (2022). *World employment and social outlook: Trends 2022.* ILO. https://www.ilo.org

Jackson, D. (2018). Developing graduate career readiness in higher education: Shifting from extra-curricular internships to work-integrated learning. *International Journal of Work-Integrated Learning, 19*(1), 23–35.

J-PAL. (2022). *Job search interventions and employment outcomes: Evidence from randomized evaluations.* Abdul Latif Jameel Poverty Action Lab. https://www.povertyactionlab.org

Ho, T. T. H., Le, V. H., Nguyen, D. T., Nguyen, C. T. P., & Nguyen, H. T. T. (2023). Effects of career development learning on students' perceived employability: a longitudinal study. *Higher Education*, *86*(2), 297-315.

Wanberg, C. R., Glomb, T. M., Song, Z., & Sorenson, S. (2005). Job-search persistence during unemployment: a 10-wave longitudinal study. *Journal of applied psychology*, *90*(3), 411.

Karyono, G., & Hermanto, N. (2013). Rancang bangun sistem tracer study online pada STMIK AMIKOM PURWOKERTO. *Semantik, 3*(1), 126–133. Retrieved from http://publikasi.dinus.ac.id/index.php/semantik/article/view/730

van Hooft, E. A., Kammeyer-Mueller, J. D., Wanberg, C. R., Kanfer, R., & Basbug, G. (2021). Job search and employment success: A quantitative review and future research agenda. *Journal of Applied Psychology*, *106*(5), 674.

Soffia, M., Wood, A. J., & Burchell, B. (2022). Alienation is not 'Bullshit': An empirical critique of Graeber's theory of BS jobs. *Work, Employment and Society*, *36*(5), 816-840.

LinkedIn Economic Graph. (2023). *How application volume affects hiring outcomes in competitive markets.* LinkedIn. Retrieved from https://economicgraph.linkedin.com

Mardiana, C. F. (2017). No title. *finance.detik.com.* Retrieved from https://finance.detik.com/berita-ekonomi-bisnis/d-3620313/63-orang-indonesia-bekerja-tak-sesuai-jurusan

Faberman, R. J., Mueller, A. I., Şahin, A., & Topa, G. (2022). Job search behavior among the employed and non-employed. *Econometrica*, *90*(4), 1743-1779.

Nugroho, Z. A., & Arifudin, R. (2015). Sistem informasi tracer study alumni Universitas Negeri Semarang dengan aplikasi digital maps. *Scientific Journal of Informatics, 1*(2), 153–160. https://doi.org/10.15294/sji.v1i2.4021

Primayana, K. H. (2016). Manajemen sumber daya manusia dalam peningkatan mutu pendidikan di perguruan tinggi. *Jurnal Penjaminan Mutu, 1*(2), 7. https://doi.org/10.25078/jpm.v1i2.45

Behle, H. (2020). Students' and graduates' employability. A framework to classify and measure employability gain. *Policy reviews in higher education*, *4*(1), 105-130.

Schwab, K. (2017). *The fourth industrial revolution.* Crown Business.

Sinambela, L. P. (2017). Profesionalisme dosen dan kualitas pendidikan tinggi. *Populis, 2*(4), 579–596.

Schomburg, H., & Teichler, U. (2007). *Higher education and graduate employment in Europe: results from graduates surveys from twelve countries* (Vol. 15). Springer Science & Business Media.

Chawla, N., Gabriel, A. S., da Motta Veiga, S. P., & Slaughter, J. E. (2019). Does feedback matter for job search self-regulation? It depends on feedback quality. *Personnel Psychology*, *72*(4), 513-541.

World Economic Forum. (2020). *The future of jobs report 2020.* World Economic Forum.

Cheng, M., Adekola, O., Albia, J., & Cai, S. (2022). Employability in higher education: a review of key stakeholders' perspectives. *Higher Education Evaluation and Development*, *16*(1), 16-31.

THE ALIGNMENT OF GRADUATE PROFILES OF THE BUILDING ENGINEERING EDUCATION PROGRAM WITH WORKFORCE REQUIREMENTS BASED ON ALUMNI AND EMPLOYER PERCEPTIONS

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ABSTRACT

In the context of performance evaluation to enhance competitiveness and the quality of higher education institutions, it is necessary to identify performance indicators, one of which is the quantity, quality, and relevance of graduates. This study aims to optimize tracer studies as an effort to improve the quality of education in the Bachelor of Building Engineering Education Program, Faculty of Engineering, Unesa. A tracer study is research on the situation of alumni, particularly regarding job searches, work situations, and the utilization of competencies acquired during their studies in the Bachelor of Building Engineering Education Program, Faculty of Engineering, Unesa. This research is planned for the year 2024, targeting alumni who graduated in 2022. The method used in this research is descriptive with a quantitative approach. The tracking is conducted by involving surveyors to encourage alumni to fill out questionnaires on the tracer study platform directly provided by the university. The results of this tracer study are then analyzed across several components to provide input for the study program to improve its future performance. The findings of this study are as follows: (1) most graduates of the Bachelor of Building Engineering Education Program are employed in private companies. The alignment between the graduates' jobs and the graduate profile of the Bachelor of Building Engineering Education Program shows a 60% match, (2) the work skills possessed and required by graduates of the Bachelor of Building Engineering Education Program show similar results, but work skills applied in the workplace show higher scores, (3) employer assessments regarding performance fall into the good category, and work skills are also categorized as good.

Keywords: *tracer study, alumni, employers, Bachelor's Degree Program in
Building Engineering Education.*

INTRODUCTION

Digital transformation and its impact on higher education and workforce
development changes occurring globally, including in Indonesia, are marked
by digital transformation. The government, through the Ministry of
Communication and Information, is implementing a telecommunications
infrastructure development program to accelerate digital transformation,
enabling its benefits to reach all levels of society (Andarningtyas, 2020).
Businesses and industries that can adapt to these changes will survive and
continue to advance. Industries that initially relied on conventional methods
are now shifting to digital approaches. This shift has led to increased demand
for new skills required by human resources (HR) in the industry.

This digital transformation aligns with the Fourth Industrial Revolution,
which alters job concepts, job structures, and the competencies needed in the
industrial world. Digital transformation has triggered a demand for HR
professionals with competencies vastly different from those of the past. The
changing characteristics of the industrial world in this era have resulted in
shifts in the types of available jobs, with some roles becoming obsolete and
new skills emerging as essential.

Tracer studies play a crucial role in education at Unesa in the current era
of the Fourth Industrial Revolution. The rapid advancements in information
technology impact all systems of life, including higher education. Unesa holds
a vital role in preparing its graduates to become skilled professionals,
necessitating feedback on the learning activities conducted, whether from
alumni, the public, or stakeholders.

Tracer studies, or alumni tracking, are integral to the education system at
Unesa. These studies aim to engage alumni in providing input for the
improvement and development of Unesa. A tracer study examines alumni
situations, particularly regarding job searches, work conditions, and the
utilization of competencies acquired during their studies at Unesa. In
developed countries, alumni tracer studies are a primary activity conducted
systematically, institutionally, and continuously. Thus, it is no surprise that
higher education institutions in developed countries are recognized for their
relevance, as they consistently conduct self-evaluation, including through
tracer studies.

A tracer study examines graduates of higher education institutions,
providing information related to alumni that can be used as evaluation
material and a reference for assessing the quality of education at a university
(Sailah, 2011; ITB Career Center Research Division, 2020). Tracer studies
serve as an effective medium to track the employment absorption of
university alumni in the workforce. Additionally, tracer studies can track the

status and condition of alumni one or two years after graduation. Tracer studies also play an essential role in gathering various information for the evaluation and development of universities. Thus, the results of tracer studies can reflect the existence and relevance of a university. Tracer study data is used as the basis for curriculum improvements, enhancement of teaching quality, and adjustment and improvement of learning systems (Editorial team, 2021).

The benefits of tracer studies are not limited to universities; they also provide crucial information about the relationship between higher education and the workforce. Tracer studies offer detailed and in-depth information on the job match, both horizontally (across fields of study) and vertically (across educational levels). Thus, tracer studies can help address issues of employment disparities and efforts for improvement. For universities, information on relevant competencies for the workforce can support curriculum and learning system enhancements.

Tracer studies are beneficial in mapping the business and industrial worlds, narrowing the gap between competencies acquired by alumni during their studies and the demands of the workforce (Amadi & Fadly, 2019). Furthermore, Nugraheni et al. (2020) explained that tracer studies could highlight factors such as transitions in the workforce, alumni activity maps in the workforce, horizontal and vertical alignment maps of graduates, and competency gaps between graduates and workforce demands. Adistana et al. (2021) found that over 80% of alumni from the Civil Engineering Department who are employed have jobs that align with the graduate profiles of both the Bachelor of Building Engineering Education and the Bachelor of Civil Engineering programs. The research questions of this study are as follows. (1) What is the distribution of graduates based on job types and the level of alignment with the graduate profile of the Bachelor of Building Engineering Education Program?, (2) What work skills are mastered and needed by graduates of the Bachelor of Building Engineering Education Program?, (3) How do employers evaluate alumni of the Bachelor of Building Engineering Education Program?

METHODS

This research is a descriptive study with a quantitative approach. The study aims to obtain information about graduates of the Bachelor of Building Engineering Education Program. A questionnaire was used as a data collection tool to gather information. The data obtained were quantitative and were analyzed using descriptive quantitative analysis.

The population in this study consisted of all alumni of the Bachelor of Building Engineering Education Program who graduated in 2022, totaling 26 individuals. The sampling technique used in this study was non-probability sampling, specifically saturated sampling. Saturated sampling is a technique

where all members of the population are used as the sample, which in this case included all 26 graduates of the program from 2022.

The data collection technique for this tracer study was conducted through the tracer study website at http://tracerstudy.unesa.ac.id/ . To facilitate data collection, alumni WhatsApp groups were also utilized. The data required for this research were collected using the above techniques, and the instruments used included questionnaires for graduates and questionnaires for graduate users.

The research data collected were then quantitatively analyzed and presented in tables and graphs, providing a clear picture of the distribution of the aforementioned variables as indicators. This study aims to determine the relevance of graduates as a basis for decision-making by leadership to take steps to ensure that graduates can be accepted in fields aligned with their expertise.

RESULTS AND DISCUSSION

Employment Status Data of Graduates

The Bachelor of Building Engineering Education Program at State University of Surabaya is one of the programs that produces vocational school (SMK) teachers. Based on the tracer study results, the employment status data of alumni from the Bachelor of Building Engineering Education Program at Surabaya State University, graduating in 2022, can be seen in Figure 1.
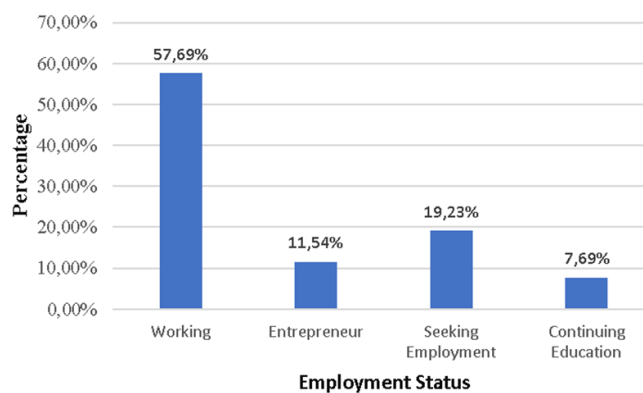
Figure 1. Employment Status Data of 2022 Graduates of the Bachelor of Building Engineering Education Program

Based on Figure 1, it was found that 57.69% of graduates are employed, while 19.23% are still seeking employment. Additionally, 11.54% have become entrepreneurs, and 7.69% of alumni are pursuing further studies.

Type of Employment

The type of employment of graduates from the Bachelor of Building Engineering Education Program is categorized based on the type of company. There are six possible answers: government institutions, NGOs, private companies, self-owned businesses, state-owned enterprises (SOEs) or regional-owned enterprises (ROEs), and multilateral institutions / organizations. The distribution of company types for the graduates can be seen in Figure 2.
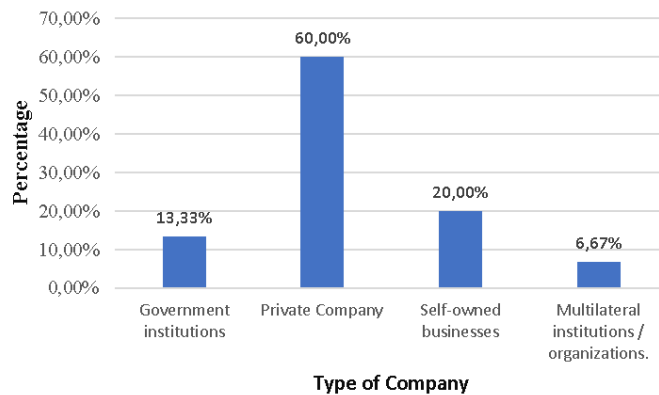

Figure 2. Types of Companies Where Graduates Are Employed

Based on Figure 2, it was found that 60.00% of graduates are employed in private companies. Graduates working in government institutions and multilateral institutions/organizations make up 13.33%. The remaining graduates are employed in their own businesses. The job titles of graduates from the Bachelor of Building Engineering Education Program can be seen in Figure 3.
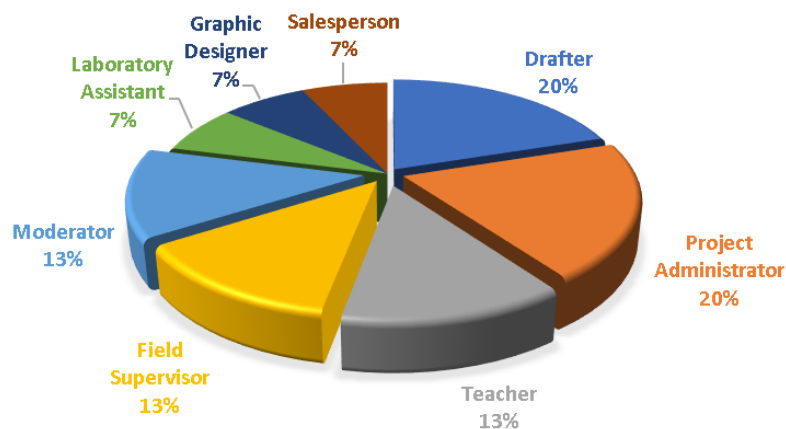
Figure 3. Job titles of graduates

Based on Figure 3, it was found that 20% of graduates work as drafters, 20% as project administrators, 13% as teachers, 13% as field implementers, 13% as moderators, and 7% are employed in other roles such as laboratory assistants, graphic designers, and sales.

Level of Alignment

The level of alignment between graduates' jobs and their study program is assessed on a five-point scale: very relevant, relevant, somewhat relevant, less relevant, and not relevant at all. The results of graduates' responses regarding the alignment of their jobs with their study program can be seen in Figure 4.
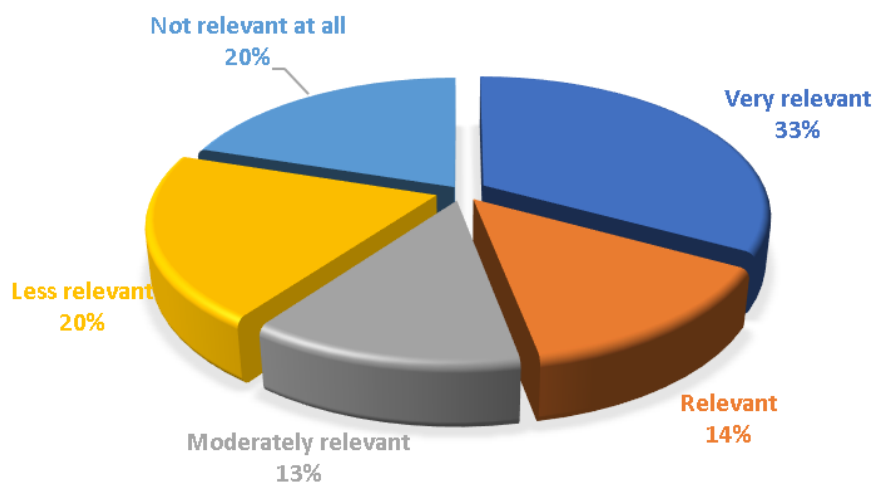
Figure 4. Level of Job Alignment for Graduates

Based on Figure 4, it was found that 33% of graduates answered "very relevant" and 14% answered "relevant." These results indicate a high level of alignment between graduates' jobs and their study program. However, 20% of graduates still responded that their job type was "not relevant at all" to their study program.

Work Skills Acquired Upon Graduation

The work skills possessed by graduates are the skills acquired by alumni upon completing the Bachelor of Building Engineering Education Program. These skills are developed during academic and non-academic activities throughout their studies. The average work skills possessed by graduates, based on the survey results, can be seen in Figure 5.
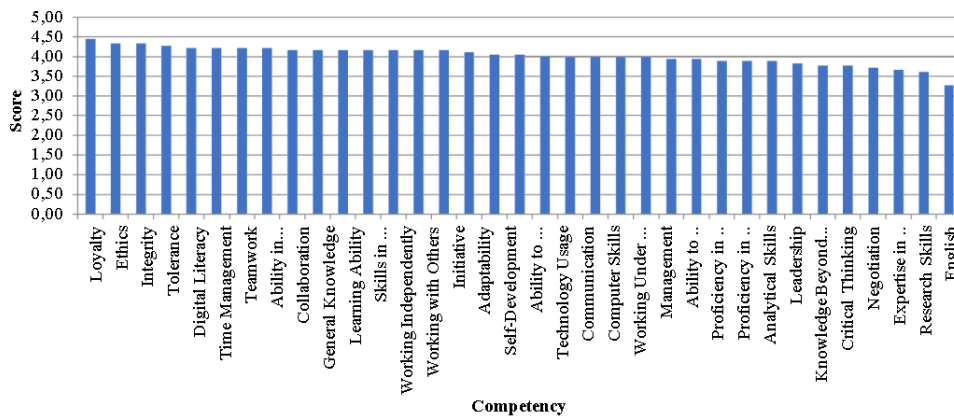
Figure 5. Work Skills Acquired by Graduates

Based on Figure 5, it was found that among the 35 work skills, the ranking of skills from highest to lowest is as follows. The five highest-rated skills possessed by alumni upon graduation from the Bachelor of Building Engineering Education Program in 2022 are loyalty, ethics, integrity, tolerance, and internet skills. On the other hand, the skills with the lowest average ratings are negotiation, knowledge in the field or discipline, expertise based on the field of study, research skills, and English language proficiency.

Work Skills Needed in the Workplace

The work skills needed in the workplace are the skills required when working in the industry. These skills are necessary for alumni after they enter the workforce. The average work skills required by graduates in the industry can be seen in Figure 6.
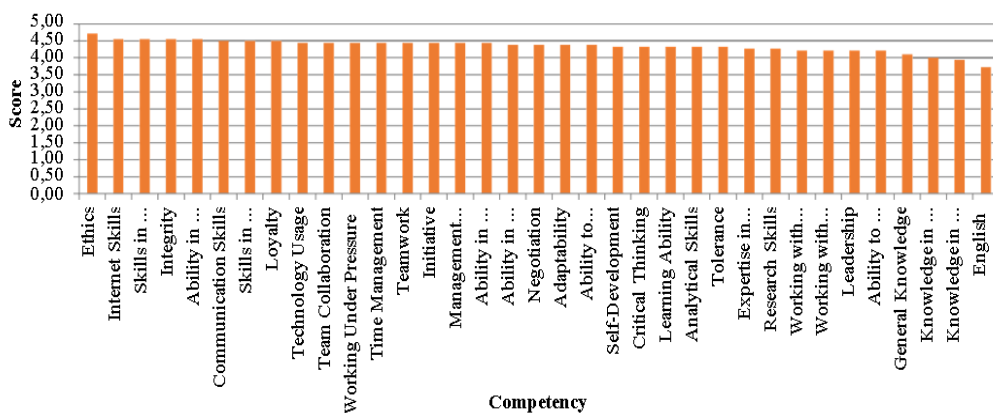

Figure 6. Work Skills Required by the Industry

Based on Figure 6, it was found that among the 35 work skills, the ranking of skills required by the industry for graduates of the Bachelor of Building Engineering Education Program, from highest to lowest, is as follows. The five most highly required skills in the workforce are ethics, internet skills, computer skills, integrity, and responsibility. On the other hand, the skills with the lowest average ratings are lifelong learning ability, general knowledge, knowledge in the field or discipline, knowledge outside the field or discipline, and English language proficiency.

Comparison of Work Skills Possessed by Graduates and Those Required by the Industry

Ideally, the work skills possessed by graduates and those required by the industry should be the same or closely aligned, so that graduates do not face difficulties in finding employment and adapting to the workforce. The results of the comparison between the skills possessed by graduates and the skills required by the industry can be seen in Figure 7.
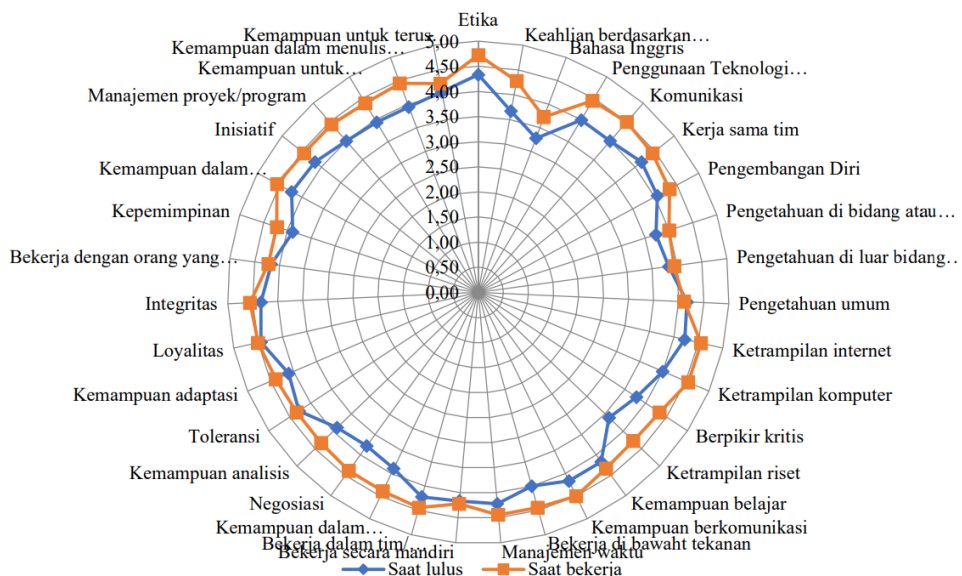

Figure 7. Comparison of Work Skills Possessed by Bachelor of Building Engineering Education Program Graduates and Those Required by the Industry

Based on Figure 7, it was found that the work skills possessed by graduates have an average score lower than the average score of the work skills required by the industry. This indicates a gap between the graduates' abilities and the industry's needs, suggesting the need to enhance skills to

align with these requirements. One way to address this gap is by integrating the work skills required by the industry into the university curriculum.

Evaluation of Alumni by Employers

The employers of the alumni who participated as respondents are four institutions: Javaland Architect, PDAM Surya Sembada Kota Surabaya, PT. Graha Muriatama Indonesia, and SMK Negeri 2 Surabaya. The performance of alumni based on the evaluation from the head of schools can be seen in Table 1.

Table 1. Alumni Performance

No.	Employer	Number of Alumni	Alumni Performance
1.	Javaland Architect	1	Good
2.	PDAM Surya Sembada Kota Surabaya	1	Very Good
3.	PT. Graha Muriatama Indonesia	2	Good
4.	SMK Negeri 2 Surabaya	8	Good

Based on Table 1, it was found that the average performance of alumni, according to employers, is considered good. The evaluation of work skills by employers can be seen in Figure 8.
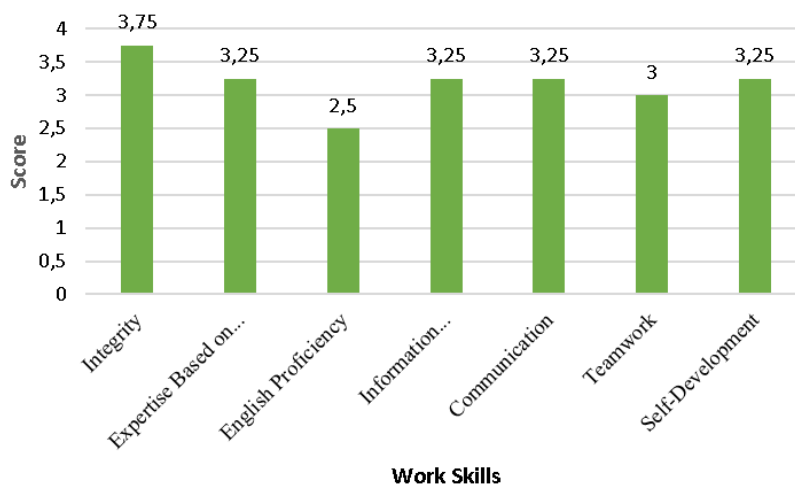

Figure 8. Employers' Evaluation of Alumni Work Skills

Based on Figure 8, it was found that among the seven work skills assessed, the highest scores were given to integrity (ethics and morals), followed by the use of information and technology. The lowest score was for English language skills. In addition to work skills, employers also highlighted

areas where alumni were lacking and skills that should be added. According to the four employers, the areas where alumni lacked proficiency were communication and presentation, particularly the use of English, and leadership and work pattern development. The skills that need to be added to the study program include Building Information Modeling (BIM).

CONCLUSION

Based on the data analysis and discussion, the following conclusions can be drawn. (1) The majority of graduates of the Bachelor Civil Engineering Education Program work in private companies. The alignment between graduates' jobs and the program's profile shows that 60% of the jobs are suitable. (2) The work skills possessed and required by the graduates of the Bachelor of Building Engineering Education Program are almost the same, but the work skills in the workplace show higher scores. (3) The evaluation from employers regarding alumni performance is categorized as good, and the work skills are also considered good.

Based on the conclusions above, the recommendations from this study are as follows. (1) The study program should use the results of the tracer study as a reference in formulating the curriculum to ensure that the work competencies align. (2) Alumni should actively communicate with the program to provide information related to jobs and the emerging skills needed in the workforce.

REFERENCE

Andarningtyas, N. (2020). Menyambut era transformasi digital 2021. *Antaranews*. Cited from antaranews.com/berita/1921172/menyambut-era-transformasi-digital-2021

Sailah, I. (2011). *Perlunya tracer study untuk pendidikan tinggi*. Jakarta: Direktur Pembelajaran & Kemahasiswaan Ditjen Dikti.

Divisi Riset ITB Career Center. (2020). *Report tracer study ITB 2020*. Bandung: Penerbit ITB.

Tim Penyusun. (2021). *Buku pedoman tracer study Universitas Negeri Surabaya*. Surabaya: Unesa.

Amadi, J., Fadly, B., & Lusiah, L. (2019). Studi pelacakan alumni program studi manajemen dan program studi akuntansi Sekolah Tinggi Ilmu Ekonomi IBBI. *Jurnal Ilman: Jurnal Ilmu Manajemen, 6*(1).

Nugraheni, Y., Susilawati, S., Sudrajat, S., & Apriliandi, A. (2020). Tracer study analysis of vocational education in Politeknik Negeri Bandung with exit cohort as an approach. In *First International Conference on Applied Science and Technology (iCAST 2018)* (pp. 110–115). Atlantis Press.

Adistana, G. A. Y. P., Nusantara, D. A. D., Wulandari, M., Mulyono, W. D., & Rahmadyanti, E. (2021). Tracer study of alumni on the outcome's study programs in the Civil Engineering Department Universitas Negeri Surabaya. In *International Joint Conference on Science and Engineering 2021 (IJCSE 2021)* (pp. 705–709). Atlantis Press.

DESIGNING A TRIMARAN FISHING BOAT TO IMPROVE WORK SAFETY FOR TRADITIONAL FISHERMAN IN INDONESIA

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ABSTRACT

As the second largest nation in capture fisheries in the world after China, Indonesia has a very large fleet of fishing boat. The main problems encountered on fishing vessels in Indonesia are the limited technology on board, and boat safety issues. One type of fishing boat that is common in Indonesia is a boat with "Cadik" or outrigger. The characteristics of an outrigger boat are the presence of a main hull with a length of between 7 meters - 12 meters, with a main hull width ranging from 0.9 meters - 1.2 meters. The shape of the main hull of the boat which tends to be long with a small width has problems in terms of boat stability, namely the boat is easy to roll, especially when fishermen are on one side of the boat to lower the net. To overcome this issue, fishermen generally install outriggers made of bamboo on both sides of the boat to increase the balance or stability of the boat. Based on this problem, a fishing boat was designed that applies the trimaran hull concept, which is the boat with three hulls. The function of the side-hull in addition to increasing the stability of the boat also as a compartment to store fishing gear and other fishing equipment. Meanwhile, the area between the main hull and the side-hull will function as a connecting deck, thus expanding the fishermen's working area and increasing the fishermen's work safety.

Keywords: trimaran. fishing boat, work safety

INTRODUCTION

As an archipelagic country with potential marine wealth in the form of marine capture fisheries, Indonesia has a very large number of fishing communities that relay on the sustainability of the fisheries sector. These fishermen utilize various forms of boats to help them catch fish either at a limited distance from their village with a sailing time of less than one day, or by using larger and more complex ships with a sailing time of up to 1-2 weeks or even several months. Fishermen with an operational time of less than 1 day or one day fishing generally use simple boats, namely long-boats equipped with outriggers on both sides of the boat to ensure the stability of the boat, especially during fishing operations. The weakness found in long-boats with outriggers is the relatively limited working area of fishermen, namely only in the main hull area, while the width of the ship is wider with the presence of outriggers on both sides of the ship (Wibawa & Birmingham, 2018). So that the function of the outriggers in this case has not been utilized optimally.

Figure 1. Traditional fishing boat with outrigger made of bamboo

Based on the above, a fishing boat has been designed that adopts a trimaran hull, namely a hull with 3 hulls side by side. One hull as the main hull in the middle of the boat, while the other two hulls are on the right and left sides of the main hull as balancing hulls. A trimaran boat is known to have very good boat stability (Gaspersz & Luhulima, 2021; Amiruddin & Yudo, 2023; Waskito & Yanuar, 2021), has a smaller draft (Luhulima, 2021), and a larger deck area compared to a boat with a single

hull (Budianto et al., 2021; Mutmainah et al., 2019). In this study, the function of the side hull has been modified and optimized so that: 1) fishermen can use the side hull as additional space to store fishing gear or other equipment. 2) the shape of the side hull is designed in such a way that it has a buoyancy that can withstand the load of at least 1 fisherman so that the side hull can also function as a work area when lowering the net. 3) the area between the main hull and the side hull is also equipped with a connecting board, so that the area that previously could not be used can now be used as a work area.

The study was conducted on the design of the side hull. The distance between the main hull and the side hull has been determined at a fixed distance, while the dimensions of the side hull, namely the width of the side hull, were varied. From these variations, the ideal side hull size was identified so that the ship would remain in a safe condition with the entire surface of the main and side hulls not sinking even though the fishermen were at the outermost point of the trimaran fishing vessel.

The objective of the study is to obtain the optimum dimension of trimaran side-hull, so that the fishermen can have a wider space on board as a working area when hauling or lowering their fishing gear. This will further increase the work safety of fishermen during fishing trip.

METHODS

The trimaran fishing boat was designed by maximizing the function of the side-hull, in addition to ensuring the stability of the vessel, also to increase the working area of fishermen when hauling the fishing gear. Based on this targeted outcome, variations were made to the dimensions of the side hull. The main dimensions of the vessel used as a case study are as follows:

Table 1. Trimaran Main Hull Dimensions

Dimension	Notation	Value (m)
Length Overall	L_{OA}	7.00
Length of Water Line	L_{wl}	6.60
Breadth	B	1.20
Depth	H	0.60
Draught	T	0.25

While the side hull dimensions were varied in the width of the side hull. Variations were made to obtain the optimal dimensions of the side hull, namely with the minimum possible size for consideration of the weight of the ship, but still able to withstand the weight of the fisherman when standing on the side hull. Table 2 shows the dimensions of the side hull and variations in the width of the hull.

Table 2. Trimaran Side Hull Dimensions

Dimension	Notation	Boat A (m)	Boat B (m)	Boat C (m)
Length Overall	L_{OA}	3.50	3.50	3.50
Length of Water Line	L_{wl}	3.10	3.10	3.10
Breadth	B	0.40	0.30	0.20
Depth	H	0.45	0.45	0.45
Draught	T	0.10	0.10	0.10

In order to have optimum dimension of side-hull, the trimaran hull body is designed with three variations. The total breadth of the trimaran boat is kept constant at 3,6 meters. The design of the lines plan of the trimaran fishing boat is as shown in Figure 3, while the General Arrangement design of the boat can be seen in Figure 4 below.
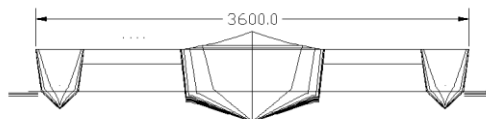

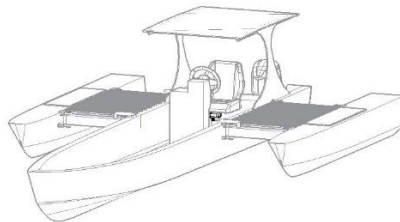**Figure 3.** Design of lines plan for 0.4 meters breadth side-hull

Figure 4. General Arrangement for trimaran fishing boat

As seen in Figure 4, the area between main-hull and side-hull and the area of the side-hull itself were designed to be able to be used by

fishermen as the working area. Therefore, it is important to ensure that the side-hull has the proper buoyancy to hold the fishermen weight, which is assumed to be 75 kg. Analysis was conducted on the buoyancy capacity of each side hull variation. In addition, analysis was conducted on the balance of the boat when the fishermen were on the outermost side of the side hull to see the condition of the ship's roll and trim. The analysis was conducted using Maxsurf Modeler software, by calculating the hydrostatic characteristic of the selected side-hull.

RESULTS AND DISCUSSION

To obtain the optimal side hull dimensions and the minimum draft required, three variations of the side hull dimensions were compared in terms of displacement by considering the minimum displacement required. Three designs of side-hull can be seen in Figure 5 bellow.
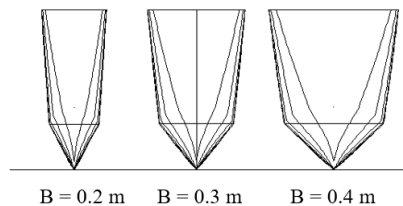

B = 0.2 m   B = 0.3 m   B = 0.4 m

Figure 5. Lines plan of side-hull variations

In addition to taking into account the weight of the fisherman, the analysis on the side hull buoyancy capacities must also take into account the weight of the side hull construction itself. So that the minimum buoyancy needed is the total weight between the weight of the fisherman and the weight of the side hull construction.

The calculation of the structures weight of each side-hull was carried out by taking into account the area of the side hull shell expansion and the weight per square meter of the ship's structure if it is built with FRP (fiberglass reinforcement plastic) material. The results of the weight calculations for each side-hull can be seen in the table below.

Table 3. The light-weight of single side hull

Boat	Side-hull beam (m)	Light-weight (kg)
Boat A	0.4	40.0
Boat B	0.3	35.8
Boat C	0.2	31.9

By taking into account the weight of the side hull construction and considering the weight of the fisherman which is assumed to be 75 kg, the minimum buoyancy requirement for the side hull is at least in accordance with Table 4.

Table 4. The minimum buoyancy of side hull

Boat	Side-hull beam (m)	Minimum buoyancy needed (kg)
Boat A	0.4	115.0
Boat B	0.3	110.8
Boat C	0.2	106.9

Afterward, the buoyancy of each side hull was calculated at several draft conditions. The calculation results using Maxsurf software show that the buoyancy of each side hull for several water draft conditions is in accordance with Table 5 below.

Table 5. Displacement for each draft of side-hull

Boat	Side-hull beam (m)	Displacement single Side-hull (kg)		
		Draft 0.1 m	Draft 0.2 m	Draft 0.3 m
Boat A	0.4	64.95	110.50	159.35
Boat B	0.3	48.70	82.90	119.55
Boat C	0.2	32.50	55.25	79.70

Based on Table 4 regarding the minimum buoyancy requirement for each side-hull and table 5 which shows the buoyancy of each side hull at several draft conditions, hence, a graph of the relationship between the minimum buoyancy requirement for each side hull and the availability of buoyancy at several draft conditions is drawn up as Figure 6 below.
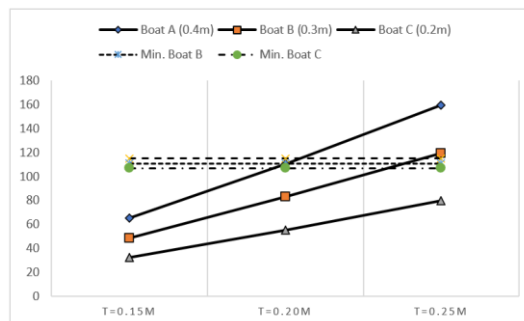

Figure 6. Minimum buoyancy required for each side-hull

The graph above shows the minimum buoyancy required and buoyancy available for each side-hull. The result show that only a side-hull with a breadth (B) of 0.4 meters can handle the weight of the fishermen and the weight of the hull construction, with a minimum draft of 0.21 meters.

CONCLUSION

Based on the results of side-hull displacement calculations for the three variations of the trimaran boat side hull, the following conclusions were obtained:

1) Trimaran fishing boats can be a substitute for fishing boats with outriggers with the advantage of a wider working area and an impact on the work safety of fishermen.
2) In this case, the minimum breadth (B) of the side hull should be 0.4 meters, with the minimum draft should be 2.1 meters. This side-hull dimension could support the weight of one fisherman with 75 kg weight and the light-weight of the side-hull structures.
3) Variations on the side-hull in terms of shape and volume under water can be done to obtain optimum buoyancy.

ACKNOWLEDGEMENT

REFERENCES

Wibawa, P.A. and Birmingham, R. (2018) . Improving safety working environment on Indonesian fishing fleet: A case study on local fishing communities in East Java, Mastic2018 Maritime Safety International Confrence. Bali.

Budianto, Wibawa, P.A., Ruddianto, and Priyambodo, N.A. (2021). Perancangan Rencana Umum Kapal Ikan Trimaran Mv. Bisikan

Untuk Perairan Laut Selatan Jawa, Proceeding *Seminar Master PPNS*.

Gaspersz, F and Luhulima, R. B. (2021). Analisa Titik Kritis Gerakan Roll Kapal Trimaran Untuk Diaplikasi Pada Kapal Ikan Purse Seine. in *ALE Proceeding*. pp. 44–50. doi: 10.30598/ale.4.2021.44-50.

Amiruddin, W. and Yudo, H. (2023). Analisis Pengaruh Posisi Side hull terhadap Karakteristik Rolling Motion dengan Metode Trochoidal Curve pada Kapal Trimaran. Jurnal *TEKNIK*.

Mutmainah, M., Amiruddin, W. and Rindo, G., (2019). Analisa Teknis Ekonomis Modifikasi Kapal Monohull Menjadi Kapal Trimaran, Studi Kasus Kapal Dongkrok di Jepara. *Tek. Perkapalan*, vol. 8, no. 1, pp. 128–136.

Luhulima, R. B., (2021). Pengembangan Kapal Perikanan Trimaran: Kajian Mengenai Kebutuhan Tenaga Kapal, Keamanan Dan Kenyamanan. *ALE Proceeding*, vol. 4, pp. 37–43.

Waskito K.T. and Yanuar. (2021). On the High-Performance Hydrodynamics Design of a Trimaran Fishing Vessel. *J. Adv. Res. Fluid Mech. Therm. Sci.*, vol. 83, no. 1, pp. 17–33.

Tupan, J. and Luhulima, R.B. (2021). Perbandingan Kapal Monohull, Catamaran, Trimaran Berdasarkan Tinjauan Operasional Penggunaan Bahan Bakar," *ALE Proceeding*, vol. 4, pp. 30–36.