ISSN 1978-6743
E-ISSN 2477-3948

UNUSA

SK. No. 85/M/KPT/2020
S4
ACCREDITATED

Jurnal Ilmiah Kesehatan

(Journal of Health Science)

Fakultas Keperawatan dan Kebidanan
Universitas Nahdlatul Ulama Surabaya

Jurnal Ilmiah Kesehatan (Journal of Health Science) | Volume 17 No-1 | Pages 1-99 | Februari 2024

DOAJ doi Crossref Content Registration sinta S4 Science and Technology Index Google Scholar
Dimensions indonesia OneSearch ROAD Directory of Open Access Scholarly Resources GARUDA Garba Rujukan Digital

Jurnal Ilmiah Kesehatan (Journal Health Science)
ISSN 1978-6743
Vol 13, Nomer 1, Februari 2024

Berisi tulisan yang diangkat dari hasil penelitian dan konseptual di bidang kesehatan. Terbit pertama kali tahun 2012 dengan frekuensi dua kali pertahun.

Alamat Penyunting dan Pelaksana Tata Usaha : Lembaga Penelitian dan Pengabdian Masyarakat Universitas Nahdlatul Ulma Surabaya. Kampus A Jl. Smea 57 Surabaya. Kampus B Jl. Jemursari 51-57 Surabaya. Website: http://unusa.ac.id/home. Email:jhs2018@unusa.ac.id

Jurnal Ilmiah Kesehatan (Journal Health Science)
ISSN 1978-6743
Vol 16, Nomer 1, Februari 2024

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

The Effect of Health Education Based on Islamic Teachings on Knowledge Level of Toddlers' Parents Regarding Singapore Flu

Ignasia Nila Siwi[1]

[1]*STIKes Madani, Jl. Wonosari Km. 10 Karanggayam, Sitimulyo, Piyungan, Bantul, Daerah Istimewa Yogyakarta, Indonesia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

HFMD, health education according to Islamic teachings, parent's knowledge level

CORRESPONDENCE

E-mail: ignasiasiwi@gmail.com

A B S T R A C T

HFMD is an infectious disease that occurs in children under five, especially at school or daycare. This research aims to determine the effect of providing health education according to Islamic teachings on the level of parents' knowledge about HFMD in toddlers. The research design used Quasi-Experimental with Group Pretest and Post Test Design. The sample in this research was 22 respondents with a total sampling technique. The analysis used in this research was univariate analysis and paired t-test analysis. The results of the study used the paired t-test and found that there were significant differences in the pretest and posttest values of parents' knowledge about HFMD in children under five with a p-value of 0.000 (<0.05). This research concluded that there was an effect of providing health education according to Islamic teachings on the level of parents' knowledge about HFMD in children under five.

INTRODUCTION

Hand, foot, and mouth disease (HFMD), or Singapore flu is an acute viral infectious disease. It is most often caused by coxsackievirus A16 (CVA 16) and enterovirus 71 (EV71) and is self-limiting (Purwanthi, 2016). This disease is also often referred to as "Singapore flu", allegedly because, in 2000, this disease became epidemic in Singapore and caused the death of several children (Purwanthi, 2016). HFMD most often affects children under 10 years of age and rarely affects adults.

HFMD is a disease caused by entrovirus infection, especially Coxsackie A 16 (CVA 16) and Enterovirus 71 (EV 71) viruses (Purwanti, 2016). HFMD is generally characterized by a rash or bumps appearing in the mouth, hands, and feet. It is sometimes accompanied by blisters. In certain cases, they can also be found on the knees, elbows, buttocks, or genital area. Symptoms and signs of HFMD will usually appear within 3-6 days after infection with the virus. Symptoms that will appear are usually pain in the throat or mouth, fever, decreased appetite, malaise, and headache. These initial symptoms will usually last up to 1-2 days. However, not everyone who has HFMD will experience these symptoms. It is because most adults often do not experience any symptoms at all but are potential carriers of the HFMD virus and spread the virus.

In the case of HFMD, the most common complications are oral ulceration pain and dehydration which due to lesions in the mouth area can make it difficult to drink and eat. However, in some cases, HFMD can also

https://doi.org/10.33086/jhs.v16.i03.4227

cause severe complications such as meningitis and encephalitis, and even death. Several other cases also show that HFMD can cause complications in the form of loose fingernails and toenails and occurs several weeks after the acute phase of HFMD. However, the disorder is temporary and the nail may grow back. However, not everyone who gets HFMD will experience all of these symptoms.

HFMD can be transmitted through direct contact from person to person through the respiratory route, air (sneezing, coughing), nasal secretions, saliva, throat (saliva, sputum), fluid from vesicles or feces of infected people, close contact with people infected (talking, hugging, kissing). HFMD is also a common disease that occurs in schools, orphanages, hostels, Islamic boarding schools, and daycare centers. This is because those places have frequent diaper changes and bowel practices.

Singapore flu is an infectious disease that spreads easily, especially at school, and occurs in toddlers. Based on the previous research, data on epidemic cases of Singapore flu that occurred in toddlers at the KB and TPA Bunayya ICBB were obtained. In addition, there are teachers and parents at the KB and TPA Bunayya ICBB who don't know how to deal with the Singapore flu. Therefore, the researchers wanted to know the effect of Singapore flu health education according to Islamic teachings on the level of parental knowledge in KB and TPA Bunayya ICBB in 2022.

METHOD

This type of research is a quasi-experimental research with One Group Pre test and Post Test Design. The research started with the initial data collection in May 2022 and the implementation of this research was carried out in August - September 2022. The research location was at KB and TPA Bunayya ICBB. The population in this study were all parents. Samples were taken by purposive sampling technique with a total sample of 22 people. The data collection technique uses a questionnaire on the level of teacher knowledge about Singapore flu/HFMD/PTKM which has been tested for validity and reliability (Qi et al., 2019). The data analysis used was paired t-test.

RESULT

The results of research conducted at the KB and TPA Bunayya ICBB regarding the influence of Singapore flu health education based on Islamic teachings on the level of parental knowledge are known as follows:

https://doi.org/10.33086/jhs.v16.i03.4227

Table 1. Frequency Distribution of Respondent Characteristics

Characteristic	Frequency	
	n	%
Gender:		
Female	22	100
Education Level:		
a) University	18	81,82
b) High school or equivalent	4	18,18
Monthly income:		
a) Low	4	18,18
b) Moderate	9	40,91
c) High	2	9,09
d) Very high	7	31,82
Age:		
a) 20-29 years	6	27,27
b) 30-39 years	11	50
c) ≥ 40 years	5	22,73
Total	22	100

Data source: Primary data for 2022

According to Table 1, the most gender is female of 22 people (100%). The highest level of education is tertiary education for 18 people (81.82%). The highest income per month is the medium category with 9 people (40.91%). The most age is 30-39 years old of 11 people (50%).

Table 2. Differences in Mean Pretest and Posttest Knowledge Levels of Parents in TK and KB Bunayya ICBB in 2022

Parameter	Value
mean pre-test	6,04
mean post-test	12
95% Confidence Interval of the Difference:	
Lower	-6,61
Upper	-5,29
Std. Deviation	1,49
Sig. (2-tailed)	0,00

Data source: Primary data for 2022

Based on Table 2, the mean value of the level of parental knowledge before being given Singapore flu health education based on Islamic teachings (pretest) is 6.04. The mean value of the level of knowledge of parents after being given Singapore flu health education according to Islamic teachings (posttest) is 12. The significance value of the difference in the mean pre and post-test values is 0.00.

DISCUSSION

The result of the research by Mansur & Ahmad (2021) stated that the age, occupation, education level, and income of respondents affect the level of knowledge of HFMD ($p<0.05$). This is based on Table 1. The mean pre-test value is lower than the mean post-test value shown in Table 2 due to information related to the Singapore flu, which is less, the effect of age, level of education, and level of income. And the result of the research conducted by Mansur & Ahmad (2021) stated that the age, occupation, education level, and income of respondents affected the level of knowledge of HFMD ($p<0.05$). Another reason for the low

https://doi.org/10.33086/jhs.v16.i03.4227

mean level of knowledge is that health workers have never been given health education related to the Singapore flu. This is in line with the research by Negara & Prabowo (2018) which stated that there is no effect between education and knowledge.

The mean value of the level of parental knowledge after being given health education on Singapore flu based on Islamic teachings is 12. This is because the respondents received health education about the Singapore flu. In addition, the level of education that is not too diverse, namely only two categories of high school and diploma/bachelor is one of the supporting factors for easy acceptance of knowledge through health education. Mansur & Ahmad (2021) stated that the age, occupation, education level, and income of respondents affected the level of knowledge of HFMD ($p<0.05$). This is in line with the research of Negara & Prabowo (2018) which stated that there is an influence between age and knowledge. This is following the research of Ivoryanto et al., (2017) which stated that the level of community formal education correlated positively with the level of knowledge in the use of oral antibiotics.

According to the paired t-test, a p-value of 0.000 ($p <0.05$) was obtained which indicated that there was a significant difference between the mean level of parental knowledge before and after. This research is in line with the research by Arifin & Sulasih (2021) that there is an effect of providing health education on the level of mothers' knowledge about Singapore flu in toddlers with a p-value of 0.006 (<0.05). Research results by Wartiani (2013) also stated that there was a significant effect of health education on Hand, Foot, and Mouth Disease (Singapore Flu) on increasing knowledge and behavior with a value of $p = 0.000$. The result of research by Sari et al (2022) showed an increase in the knowledge of residents of Dukuh Menanggal District by 20% in terms of characteristics, symptoms, ways of transmission, and ways of preventing HFM after being given exposure to HFMD.

The research by Guo et al., (2018) stated that there was no effect of the hand-washing intervention on the parents' HFMD knowledge score with a p-value of 0.111 (> 0.05). This is because, even though the level of knowledge is high, the level of attitude and behavior for HFMD prevention is not necessarily high.

The health education material according to Islamic teachings that were delivered included the arguments of Al-Qur'an and hadith related to the Singapore Flu. The Qur'anic argument used is the Surah Yunus verse 57 (*Surat Yunus Ayat 57 Arab, Latin, Terjemah Dan Tafsir*, n.d.) which means “O humanity! Indeed, there has come to you a warning from your Lord, a cure for what is in the hearts, a guide, and a mercy for the believers.” In addition, the Surah As-Sajdah verse 21(*Surat As Sajdah Ayat 21 Arab, Latin, Terjemah Dan Tafsir*, n.d.) means " We will certainly make them taste some of the minor torment ˹in this life˺ before the major torment ˹of the Hereafter˺, so perhaps they will return ˹to the Right Path˺." Another Surah used is Asy-Syu'ara verse 80 (*Surat Asy-Syu’ara Ayat 80 Arab, Latin, Terjemah Dan Tafsir*, n.d.) means “And He ˹alone˺ heals me when I am sick.” Meanwhile, the Hadith is used in HR. Bukhari: 5246 – About Diseases and Medicines (*HR. Bukhari: 5246 – Tentang Penyakit Dan Obatnya*, n.d.) Meanwhile, the Hadith used is

HR. Bukhari: 5246 - About the Mercy which means "God did not send down the disease unless He also sent down the antidote and the medicine."

When someone gets health education, ignorance or misinformation, or perception can be minimized or even straightened out. Thus, through health education, it can improve the level of knowledge.

The limitation of the research that has been conducted is the inability to control the characteristics of the respondents in terms of age, education level, and income level.

CONCLUSION

According to the description above, it can be concluded that there is an effect of Singapore flu health education on parents' knowledge of TK and KB Bunayya ICBB.

REFERENCES

Arifin & Sulasih. (2021). Pengaruh pendidikan kesehatan terhadap tingkat pengetahuan ibu tentang flu singapura pada anak balita. *Ilmiah STIKES Yarsi Mataram*, *11*(2), 586–597.

Guo, N., Ma, H., Deng, J., Ma, Y., Huang, L., Guo, R., & Zhang, L. (2018). Effect of hand washing and personal hygiene on hand food mouth disease: A community intervention study. *Medicine (United States)*, *97*(51). https://doi.org/10.1097/MD.0000000000013144

HR. Bukhari: 5246 – Tentang Penyakit Dan Obatnya. (n.d.). https://risalahmuslim.id/penyakit-dan-obatnya/

I Gusti Ayu Putri, P. (2016). Penyakit Tangan, Kaki, dan Mulut (Hand, Foot, and Mouth Disease). *CDK-246*, *43*, 815–819.

Ivoryanto, E., Sidharta, B., & Kurnia Illahi, R. (2017). Pharmaceutical Journal Of Indonesia Hubungan Tingkat Pendidikan Formal Masyarakat terhadap Pengetahuan dalam Penggunaan Antibiotika Oral di Apotek Kecamatan Klojen. *Universitas Brawijaya*, *2*(2), 31–36.

Mansur, N. N. H., & Ahmad, A. (2021). Knowledge and Prevention Practices of Hand, Foot and Mouth Disease Among Parents and Caregivers in Bandar Puncak Alam, Selangor, Malaysia. *Malaysian Journal of Public Health Medicine*, *21*(1), 29–36. https://doi.org/10.37268/MJPHM/VOL.21/NO.1/ART.485

Negara, I. C., & Prabowo, A. (2018). Penggunaan Uji Chi–Square untuk Mengetahui Pengaruh Tingkat Pendidikan dan Umur terhadap Pengetahuan Penasun Mengenai HIV–AIDS di Provinsi DKI Jakarta. *Prosiding Seminar Nasional Matematika Dan Terapannya 2018*, *1*(1), 1–8.

Sari, D. P. dkk. (2022). Improving Knowledge to Prevent Hand, Foot, and Mouth Disease (HFMD) or Singapore Flu. *J.Abdimas: Community Health*, *3*(2), 63–69. http://journal.gunabangsa.ac.id/index.php/jach/article/view/559/207

Surat As Sajdah Ayat 21 Arab, Latin, Terjemah dan Tafsir. (n.d.). https://tafsirweb.com/7573-surat-as-sajdah-ayat-21.html

Surat Asy-Syu'ara Ayat 80 Arab, Latin, Terjemah dan Tafsir. (n.d.). https://tafsirweb.com/6490-surat-asy-syuara-ayat-80.html

Surat Yunus Ayat 57 Arab, Latin, Terjemah dan Tafsir. (n.d.). https://tafsirweb.com/3331-surat-yunus-ayat-57.html

Wartiani. (2013). *Pengaruh Health Education Hand, Foot And Mouth Disease (Flu Singapura)Terhadap Peningkatan Pengetahuan Dan Perilaku Ibu Pada Pencegahan Anak Usia Balita Di Posyandu Cempaka Pandanwangi RW 03*. Universitas Muhammadiyah Malang.

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Overview of Body Shaming Experiences in Early Adolescents at Junior High School Jember

Ni Komang Tri Pramesuari[1], Yeni Fitria[2], Fitrio Deviantony[3], Hanny Rasni[4], Enggal Hadi Kurniyawan[5]

[1,2,3,4,5] *Faculty of Nursing, Jember University, East Java, Indonesia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Early Adolescence, Physical Changes, Body Shaming experiences

CORRESPONDENCE

E-mail: yeni.fitria@unej.ac.id

A B S T R A C T

Early adolescents undergo numerous changes for the first time, leading them to adapt to these transformations. Among the most conspicuous changes is the physical transformation that renders adolescents susceptible to body shaming, which can have detrimental effects on their mental health. This study aims to delineate the experience of body shaming among early adolescents at one junior high school in Jember. The research employed an analytic observational design with a cross-sectional approach involving 297 respondents. Proportional stratified random sampling was utilized as the sampling technique, and a body shaming experience questionnaire was administered. The findings revealed that 167 respondents (56.2%) experienced body shaming to a moderate extent. The significance of this research lies in its potential to serve as a reference for providing health education regarding the prevalence of body shaming and its impact on mental health. Such education aims to enhance adolescent mental health within the school environment.

INTRODUCTION

Adolescence is a transition period between childhood and adulthood marked by physiological, psychological, and emotional changes. During this stage of development, biological, cognitive, psychological, and emotional changes in the body, brain, and individual behaviour will be interconnected simultaneously to form a developmental path from childhood to adulthood ((Kaczmarek & Trambacz-Oleszak, 2021). Kartono (1990) and Nurmala et al. (2020) state that there are three phases of development in adolescents, namely early adolescence starting at the age of 12-15 years, middle adolescence starting at the age of 15-18 years, and late adolescence starting at the age of 18- 21 years (Nurmala et al., 2020). Early adolescents are at an age stage when they experience many changes for the first time, so they need to adapt to these changes (Slametiningsih et al., 2021). The changes that occur cause adolescents to become more sensitive to comments and reactions about themselves and compare themselves to others. At this time, teenagers are prone to experiencing body shaming (Alini & Meeisyalla, 2021).

Results of research by Gam et al. (2020) stated that the experience of body shaming teenagers was more common in the last school year. As many as 45.2% of respondents received body-shaming treatment, and 6.7% (24 respondents) all the time (Gam et al., 2020). Research by Setyarini and Munawaroh (2020) regarding the experience of body shaming that occurs in junior high school students, as many as 79

https://doi.org/10.33086/jhs.v17.i01.4133

respondents (57.2%) are in the moderate category (Setyarini & Munawaroh, 2020). These data show that cases of bullying, especially the treatment of body shaming that occurs abroad and in Indonesia, are still relatively high. Treatment of body shaming carried out in early adolescence can occur in the male or female gender. *Body shaming* is a negative behavior that significantly impacts adolescents who experience it. This body shaming can occur due to the existence of beauty standards that apply in society, people's perceptions of body shaming as a regular thing and a joke in everyday life, equating and applying self-beauty standards to others, and lack of knowledge about the effects of treatment body shaming on other people.

This body shaming can occur due to the existence of beauty standards that apply in society, people's perceptions of body shaming as a regular thing and a joke in everyday life, equating and applying self-beauty standards to others, and lack of knowledge about the effects of treatment body shaming on other people (Kurniawati & Lestari, 2021). Blackwell (2015) and Atsila et al. (2021) state that body shaming will have an impact on the behaviour of someone who experiences the emergence of depression, anxiety, the emergence of suicidal thoughts, or even suicidal behaviour (Atsila et al., 2021). Other possible effects include anxiety, shame, feelings of inferiority, low self-esteem, anger, social isolation, and loss of intention to interact with others, and can even cause stress (Lestari, 2020).

The preliminary study conducted by researchers at SMP Negeri 3 Jember interviewed counseling teachers and distributed questionnaires to 15 students. The results of distributing the questionnaire to 15 students showed that around 66.7% of students had been ridiculed for inappropriate clothing, 80% of students had been ridiculed for having a fat and thin body, 80% of students had been ridiculed for having a dark body color and pimples, 73, 3% have been called with bad nicknames and used as funny material, 60% of students feel embarrassed when criticized for their speech style or body shape, 73% of students often compare their physique, and as many as 53.3% of students have felt their friends compare -compare the physique.

Based on the background above, the purpose of this study was to describe the body shaming experience in early adolescents at SMP Negeri 3 Jember.

METHOD

This study used an analytic observational design with a cross-sectional approach. This research was conducted at a junior high school in Jember, East Java. This research was conducted from September 2022 to April 2023. The population in this study was 801 students in classes VII, VIII, and IX. In this study, a proportionate stratified random sampling technique was used in this study, which is a sampling technique when the population has unequal members or elements or is heterogeneous and proportionately stratified (Siyoto & Sodik, 2015). This study obtained a sample of 297 students who met the inclusion criteria:

active status, aged 12-15 years, and willing to become respondents. The data collection tool is a questionnaire, namely a body shaming experience questionnaire which was adopted from the previous researcher Rida Putriana Sari (2020).

The body shaming experience questionnaire has 26 question items with five answer choices: never, sometimes, rarely, often, and always. The categorization of body shaming experience is divided into three parts: low, medium, and high. This study was analysed with IBM SPSS Statistic 25 Software. The data is presented in the form of frequencies and percentages, which are presented in tables. This research received ethical approval from the Health Research Ethics Committee (KEPK) Faculty of Nursing, University of Jember on January 31, 2022, with letter number 193/UN25.1.14/KEPK/2022.

RESULT

Table 1. Distribution of Age, Gender, Religion, Class, BMI, Class, Last Education of Parents, and Parents' Occupation of Students at SMP Negeri 3 Jember (n = 297)

Demographic Data		Frequency (f = 297)	Percentage (%)
Age	12 years old	20	6,7
	13 years old	100	33,7
	14 years old	95	32,0
	15 years old	82	27,6
Sex	Male	134	45,1
	Female	163	54,6
Religion	Islam	282	94,9
	Christian Protestant	12	4,0
	Catholic	2	0,7
	Hindu	1	0,3
Class	VII	95	32,0
	VIII	95	32,0
	IX	107	36,0
BMI	Very thin	105	35,4
	Thin	53	17,8
	Normal	122	41,1
	Fat	8	2,7
	Obesity	9	3,0
Parental Educational History	No school	1	0,3
	Elementary school	17	5,7
	Middle school	64	21,5
	College	215	72,4
Parents' job	Civil Servant	72	24,2
	Private – employee	88	33,3
	Entrepreneur / Self-Employed	71	23,9
	Farmer/Farm Laborers	4	1,3
	Other	51	17,2

Source: Researcher Primary Data, January 2023

Table 1. shows that the research respondents totalled 297 students from SMP Negeri 3 Jember. Nearly half of the respondents were 13 years old, with 100 respondents (33.7%). Most respondents were female, with 163 respondents (54.9%). Almost all respondents are Muslim, with 282 respondents (94.9%). Nearly half of the respondents came from class IX, with 107 respondents (36%). Nearly half of the respondents

https://doi.org/10.33086/jhs.v17.i01.4133

had a standard body mass index, with 122 respondents (41.1%). Most respondents had a high level of parental education, with 215 respondents (72.4%), and almost half of the respondents with their parents' jobs as private employees, with 99 respondents (33.3%).

Table 2. Frequency Distribution of Body Shaming Experiences for Students of SMP Negeri 3 Jember in January 2023 (n=297)

Variable	Frequency	Percentage (%)
Body Shaming Experience		
Low	126	42,4
Moderate	167	56,2
High	4	1,3
Total	297	100

Source: Researcher Primary Data, January 2023

Table 2. shows that 126 respondents (42.4%) had experienced body shaming in the low category, 167 respondents (56.2%) had experienced body shaming in the medium category, and as many as four respondents (1.3%) had experienced body shaming in the high category.

Table 3. Distribution of Body Shaming Experience Indicators for Students of SMP Negeri 3 Jember in January 2023 (n=297)

Aspect	Indicator	Body Shaming Experience							
		Low		Moderate		High		Total	
		F	%	F	%	F	%	F	%
Comment on Appearance	Clothing criticism	67	22,6	217	73,1	13	4,4	297	100
	Speaking criticism	89	30,0	178	59,9	30	10,1	297	100
	Behavioural criticism	58	19,5	228	76,8	11	3,7	297	100
	Gossiped by friends	131	44,1	158	53,2	8	2,7	297	100
Physical Comparing	Comparing yourself physically with others	137	46,1	114	38,4	46	15,5	297	100
	Physical comparison with other people	198	66,7	88	29,6	11	3,7	297	100
Physical Commentary	Being called by a wrong name	83	27,9	199	67,0	15	5,1	297	100
	Physical ridicule	146	49,2	136	45,8	15	5,1	297	100

Source: Researcher Primary Data, January 2023

Table 3. shows that in the indicator of accepting criticism for how to dress, most respondents are in the medium category, namely 217 respondents (73.1%). The indicator of accepting criticism for speaking style, most respondents were in the medium category, 178 (59.9%). The indicator accepts criticism of the level of behavior of most of the respondents in the medium category, namely 228 respondents (76.8%). The indicator of obtaining gossip is that most of the respondents are in the category of 158 respondents (53.2%). The indicator of comparing oneself physically with others was that almost half of the respondents were in a low category, 137 respondents (46.1%). Compared to other people's physical indicators, most respondents were in the low category, with 198 respondents (66.7%). The indicators are called wrong; most respondents are in the medium category, with 199 respondents (67%). The indicator of being

https://doi.org/10.33086/jhs.v17.i01.4133

ridiculed, which leads to the physicality of almost half of the respondents, is in a low category, namely 146 respondents (49.2%).

DISCUSSION

Most respondents experienced body shaming in the moderate category, namely 167 respondents (56.2%). The results of this study align with research by Fauzy & Putri (2021), which states that most junior high school students have a moderate level of body shaming behaviour, namely 30 respondents (60%) out of 50 respondents. Unknowingly, body shaming often occurs in everyday life. Even though this treatment did not have a physical impact, body shaming is included in verbal bullying (Fauzy & Putri, 2021). Body Shaming can decrease the body's responsiveness to disease or the ability to detect disease symptoms. In addition, it can also reduce the value and attention to bodily functions. This body function has a role in providing important information about physical health (Lamont, 2018).

One factor that can affect body shaming is age. In this study, almost half of the respondents with moderate body shaming experience were 14 years old, with 58 respondents (34.7%), followed by 13 with 55 respondents (32.9%). Research by Nafingah & Suroso (2020) stated that victims of bullying were more common at the age of 13 with nine respondents (30%) and 15 years with nine respondents (30%) (Nafingah & Suroso, 2020). In this teenage period, they focus on their appearance, so teenagers often feel worried about the physical changes that occur when they are disproportionate. Teenagers tend to feel insecure when their body shape and size are considered not ideal by the standards that apply in their environment (Tatirah & Mukharomah, 2019). Researchers assume that this study shows that the difference in the incidence of body shaming between the ages of 13 and 14 is fragile. This is because that age is still in the range of early adolescence, where at that age, they experience physical changes for the first time. Thus, early adolescents are vulnerable to experiencing body shaming because of the physical changes that occur.

The next factor that influences body shaming is gender. Most respondents with medium-category body shaming experience were women, as many as 101 respondents (60.5%). Teenage girls tend to be more sensitive than boys. It is easy for them to feel anxious when there are things that they cannot achieve or do not meet their expectations. This sensitive nature can cause young women to be unable to control their feelings when they get body shaming from other people (Rahayu, 2019). Researchers assume that female adolescents experience more body shaming because their body fat increases during puberty. Hence, they will likely feel ashamed of their bodies and generate negative comments from others.

The next factor that can affect body shaming is body mass index. Nearly half of the respondents with moderate body shaming experience with a fragile body mass index were 57 (34.1%), and an average of 75 respondents (44.9%). Research conducted by Utami et al. (2020) stated that adolescents with unhealthy

https://doi.org/10.33086/jhs.v17.i01.4133

eating patterns had abnormal nutritional status in 34 respondents (38.6%). Consumption of low-quality and low-nutrition foods can result in malnutrition (Utami et al., 2020). Unhealthy eating habits such as frequent snacks outside the home and not having breakfast in the morning before going to school lead to the unfulfilled nutritional status of adolescents. So this causes early adolescents to have a fragile body mass index (Hafiza et al., 2020).

Researchers assume that teenagers who experience body shaming in the moderate category *mostly* have fragile bodies and are also expected. Teenagers with a fragile body mass index get body shaming because their body size is skinny and does not match ideal standards. Other people think they have a thin body because they do not eat enough or do not like to eat, even though it can be due to genetic factors. This is what causes them to feel insecure because they have a thin body and have the potential to get body shaming. Adolescents with an average body mass index experience body shaming due to their strange appearance according to their surroundings. For example, it can be in the form of their strange clothing style, behavior, or speech style so that teenagers with an average body mass index can also experience body shaming.

Body shaming badly influences one's health, especially mental health. In dealing with this, it is necessary to try that nurses can do to reduce the impact that arises as a result of body shaming in schools. One role the nurse can play is as an educator by providing health education about body shaming and its impact on a person's mental health. In addition, it also provides counselling for victims of body shaming if the impact is disturbing their daily lives and to find out their feelings and conditions when they receive body shaming so that they can provide solutions to deal with the effects of body shaming (Rusyda et al., 2022).

CONCLUSION

The conclusion obtained in this study is that most respondents experience body shaming in the moderate category, namely 167 respondents (56.2%). In the aspect of commenting on appearance, the most frequent indicator is the indicator of receiving criticism on how to dress; most of the respondents are in the medium category, namely 217 respondents (73.1%), and the indicator of receiving criticism, the level of behavior of most of the respondents is in the medium category, namely 228 respondents (76,8%). In the aspect of physical comparison, the most frequent indicator is an indicator of physical comparison by other people; most respondents are in the low category of 198 respondents (66.7%). Regarding physical commenting, the most frequent indicator is the indicator of being called wrong; most respondents are in the medium category, with 199 respondents (67%).

https://doi.org/10.33086/jhs.v17.i01.4133

REFERENCES

Alini, & Meeisyalla, L. N. (2021). Gambar Kejadian Body Shaming dan Konsep Diri Pada Remaja di SMKN 1 Kuok. *Prepotif Jurnal Kesehatan Masyarakat*, *5*(2), 1170–1179.

Atsila, R. I., Satriani, I., & Adinugraha, Y. (2021). Perilaku Body Shaming dan Dampak Psikologis pada Mahasiswa Kota Bogor. *Jurnal Komunikatif*, *10*(1), 84–101. https://doi.org/10.33508/jk.v10i1.2771

Fauzy, T., & Putri, S. L. (2021). Pengaruh Body Shaming terhadapPerilaku Sosial Siswa di Sekolah Menengah Pertama Handayani Palembang. *Jurnal Komunikasi Dan Budaya*, *02*(02), 268–276. http://journal.unbara.ac.id/index.php/JKB

Gam, R. T., Singh, S. K., Manar, M., Kar, S. K., & Gupta, A. (2020). Body Shaming Among School-Going Adolescents: Prevalence and Predictors. *International Journal Of Community Medicine And Public Health*, *7*(4), 1324–1328. https://doi.org/10.18203/2394-6040.ijcmph20201075

Hafiza, D., Utmi, A., & Niriyah, S. (2020). Hubungan Kebiasaan Makan Dengan Status Gizi Pada Remaja Smp YLPI Pekanbaru. *JMH: Jurnal Medika Hutama*, *02*(01), 333–342. https://doi.org/10.35328/keperawatan.v9i2.671

Kaczmarek, M., & Trambacz-Oleszak, S. (2021). School-Related Stressors and The Intensity of Perceived Stress Experienced by Adolescents in Poland. *International Journal of Environmental Research and Public Health*, *18*(22), 1–16. https://doi.org/10.3390/ijerph182211791

Kurniawati, Y., & Lestari, S. (2021). Beauty Bullying or Body Shaming? Upaya Pencegahan Body Shaming Pada Remaja. *Jurnal Pelayanan Kepada Masyarakat*, *3*(1), 69–78.

Lamont, J. M. (2018). The Relationship of Mindfulness to Body Shame, Body Responsiveness, and Health Outcomes. *Mindfulness*, *10*(4), 639–649. https://doi.org/10.1007/s12671-018-1020-2

Lestari, S. (2020). Psikoedukasi Dampak Body Shaming pada Remaja. *Jrunal Pengabdian Pada Masyarakat*, *564*(2), 564–570. https://doi.org/10.30653/002.202052.528

Nafingah, A. A. B., & Suroso, J. (2020). Jurnal Keperawatan Muhammadiyah Pengaruh Behavior Skill Training Terhadap Interaksi Sosial Korban Bullying Di SMP N 1 Kaligondang Kabupaten Purbalingga. *Jurnal Keperawatan Muhammadiyah*, 165–170.

Nurmala, I., Muthmainnah, Rachmayanti, R. D., Siswantara, P., Salim, L. A., Devi, Y. P., Ruwandasari, N., Putri, T. A., & Pratiwi, A. N. I. (2020). *Mewujudkan Remaja Sehat Fisik Mental dan Sosial*. Surabaya: Airlangga University Press.

Rahayu, E. P. (2019). Dampak Penerimaan Pesan Berisi ”Body Shaming” Terhadap “Self Confidence” Remaja Perempuan di Media Sosial Instagram. *Commercium*, *02*(01), 78–82.

Rusyda, A. Y., Imelisa, R., & Bolla, I. N. (2022). Pengalaman Siswi di SMK Kesehatan Mengalami Body Shaming. *Journal of Community Health Issues*, *2*(1), 1–7.

Setyarini, I. A., & Munawaroh, E. (2020). Hubungan Antara Body Shaming Dan Citra Diri Dengan Kecemasan Sosial Pada Siswa SMP Ekasakti Semarang. *JCOSE Jurnal Bimbingan Dan Konseling*, *3*(1), 22–33.

Siyoto, S., & Sodik, A. (2015). *Dasar Metodologi Penelitian* (Ayup (ed.); 1st ed.). Yogyakarta: Literasi Media Publishing.

Slametiningsih, Astuti, M. A., Nuraenah, Narawangsah, A., & Renaissance. (2021). Psikoedukasi Insecure Pada Anak Remaja dengan Body Shaming di MTSN 03 Kota Bekasi. *Jurnal Pengabdian Masyarakat Kesehatan*, *7*(3), 19–23. https://forms.gle/G3F2gAEuZ7KsYmHA

Tatirah, & Mukharomah, R. (2019). Hubungan antara Tingkat Pengetahuan dengan Sikap Remaja Awal

Terhadap Perubahan Fisik Masa Pubertas di SMP Muhammadiyah Kluwut Tahun 2019. *Jurnal Ilmiah Kesehatan Ibu Dan Anak*, *2*(2), 63–68. https://ejournal.stikesjypr.ac.id/index.php/JULKIA/article/view/58

Utami, H. D., Kamsiah, & Siregar, A. (2020). Hubungan Pola Makan, Tingkat Kecukupan Energi, dan Protein dengan Status Gizi pada Remaja. *Jurnal Kesehatan*, *11*(2), 279–286. https://doi.org/10.26630/jk.v11i2.2051

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Study Patient Satisfaction with Covid-19 Self-Isolation At-Home Services Monitoring

Lubna[1], *Baequni Boerman*[2], *Shafira Salsabila Samara*[3]

[1,2,3] *Syarif Hidayatullah Jakarta State Islamic University, Jakarta, Indonesia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Patient satisfaction; Monitoring services Covid-19; Service quality; DKI Jakarta

CORRESPONDENCE

E-mail: baequnibae@gmail.com

A B S T R A C T

The extent of COVID-19 transmission in Jakarta has overwhelmed healthcare facilities, making it challenging to accommodate all incoming patients. Jakarta initiated the COVID-19 Self-Isolation Patient Monitoring Program at each Community Health Center (*Puskesmas*). This crucial initiative was implemented during the peak pandemic period from March to May 2022. To assess the program's success, 100 respondents were selected through purposive sampling to participate in this research. The objective of this study was to evaluate patient satisfaction and explore the relationship between patient characteristics and the five dimensions of service quality based on the SERVQUAL model. The analysis revealed an overall patient satisfaction rate of 88%. Additionally, through Chi-square analysis, the findings highlighted a significant relationship between employment status (P-value = 0.017) and service quality dimensions, including tangibility, reliability, responsiveness, assurance, and empathy (each with a P-value = 0.001) about patient satisfaction. However, lower satisfaction levels were identified in specific areas, such as the daily monitoring of a patient's conditions during self-isolation (75%), the availability of free swab tests at the *Puskesmas* (77%), and the prioritization of patient care during self-isolation (78%). This study outlines the program's strengths and areas that require service improvement to enhance patient satisfaction.

INTRODUCTION

Jakarta, as the densely populated capital city of Indonesia, faces an elevated risk of COVID-19 transmission due to its high population density, significant mobility of its residents, and the presence of numerous slum areas (Adzania et al., 2021; Caraka et al., 2020). This heightened vulnerability is starkly evident in the city's alarming COVID-19 statistics. As of September 23, 2022, Jakarta has reported more than 1,421,152 confirmed cases and a tragic death toll of 712 individuals (Minister of Health of the Republic of Indonesia. COVID-19, 2022). Between June 28 and July 30, 2021, 88,295 individuals were compelled to undergo self-isolation due to the virus (Minister of Health of the Republic of Indonesia. COVID-19, 2021). During this same period, the city recorded 265 deaths occurring outside of healthcare facilities (Kompas Cyber, 2021). These daunting figures were compounded by a severe shortage of hospital and service facilities, leading authorities to implement home self-isolation measures, even for asymptomatic patients. Tragically, a report from Annur in 2021 reveals that 2,700 patients lost their lives while in self-isolation (Annur, 2021). These sobering realities underscore the critical need for immediate and comprehensive public health interventions to address the ongoing COVID-19 crisis in Jakarta.

The Ministry of Health, through official letter No. HK 02.01 /Menkes /202/2020 issued a Self-Isolation protocol (Ministry of Health Indonesia, 2020). Local *Puskesmas* and COVID-19 tracers carry out the

https://doi.org/10.33086/jhs.v17.i01.4328

Self-Isolation monitoring service. If, during the Self-Isolation monitoring, the Patient experiences worsening symptoms, the Patient must be referred to a local hospital.

The number of patients who self-isolate is enormous. Therefore, knowing the community's acceptance and the quality of the services is necessary to implement the paradigm of patient-centered care as a significant component of the healthcare mission (Al-Abri and Al-Balushi, 2014).

The focus of health services has begun to shift towards patient-centered care. The concept is how health service providers incorporate with patients to solve health problems. Today, many health service providers realize that patient satisfaction is central to fulfilling health services at health service centers and hospitals. Several studies have proven that patient satisfaction can improve clinical outcomes, health service efficiency, and the health service business (Teisberg et al., 2020; Zaid et al., 2020). Patient satisfaction surveys are essential for designing and evaluating healthcare services by reflecting service quality from the Patient's perspective and identifying patients who need additional attention (Crane et al., 2007).

The development of digital health interventions (DHI) has made it possible to treat patients through digital networks for specific reasons, such as the distance between services and patients, the limited number of experts in an area, and reasons for transmitting diseases such as COVID-19. At this time, DHI issues are affecting organizational impact, data security, choice of comparator, technical considerations, unmet medical needs, and legal aspects (Kolasa and Kozinski, 2020). Therefore, research on patient satisfaction with COVID-19 Monitoring Services is very much needed.

METHOD

This research was a Quantitative Approach with a Cross-Sectional Study design conducted in the Kembangan District Health Center from April to June 2022. This study used the SERVQUAL model with Tangibles, Reliability, Responsiveness, Assurance, and Empathy as the independent variable and Patient Satisfaction as the dependent variable. The study employed a purposive sampling method to select participants from the population of COVID-19 patients who underwent self-isolation in the PHC Kembangan District of West Jakarta and received daily monitoring services between Mach and May 2022. The total population consisted of 1476 individuals, and a sample size of 100 was obtained using the Sloin formula.

$$N = \frac{N}{N(d)^2 + 1one} = \frac{1476}{1476(0{,}1)^2 + 1} = 93{,}65$$

The study used a Google Forms questionnaire to collect data on patient satisfaction with monitoring services in Jakarta's Sub-District Health Centers (*Puskesmas*). The questionnaire included five dimensions of satisfaction measured on a Likert scale. The dimensions were Tangible, Reliability,

Responsiveness, Assurance, and Empathy. The Tangible dimension consisted of four questions related to the provision of medicine, swab tests, and the professional appearance of the health center staff.

The Reliability dimension had six questions related to the reliability and responsiveness of the health center staff in providing services and answering questions. The Responsiveness dimension had five questions about the staff's speed and skill in responding to complaints and needs and keeping patients informed. The Assurance dimension had five questions related to the security of patient data, adequacy of medicine and vitamins, adherence to health protocols, and building patient confidence. The Empathy dimension had four questions about the staff's consideration, friendliness, monitoring, and care toward patients. The respondents' satisfaction with the services the Kembangan District Health Center provided was also measured. The answers were categorized as either satisfied or not satisfied.

The primary data was collected through Google Forms and analyzed using a statistical program. The questionnaire included questions about respondent characteristics and five service quality dimensions (SERVQUAL), and the results were grouped based on the average Likert scale ratings across the five dimensions. Before distribution, we conducted a questionnaire trial in selected locations, and the results demonstrated that the questionnaire was both valid and reliable. Then, the data was analyzed using the chi-square test.

RESULT

This study describes the characteristics of respondents based on age group, gender, education level, job status, and monthly income. The analysis results of the respondents' characteristics can be seen in Table 1 below.

Table 1 Respondent Characteristics of Self-Isolation Patients

Respondent Characteristic's	n
Age Group	
Non-Productive (<15 and >64 year)	3
Productive (15-64 years)	97
Gender	
Male	46
Female	54
Education Level	
Elementary School	34
Higher Education	66
Job Status	
Unemployment	29
Employment	71
Monthly Income	
< IDR 4,600,000	32
≥IDR 4,600,000	68

https://doi.org/10.33086/jhs.v17.i01.4328

Table 1 presents the characteristics of the study participants, which revealed that 97 respondents were in the productive age group (15-64 years), 54 were female, 66 had higher education, 71 were employed, and 68 had a monthly salary of at least IDR 4,600,000 or equivalent to Jakarta's minimum wage.

Table 2 Frequency Distribution of Respondents' Statements on Monitoring Services obtained when Self-Isolating at home on the five dimensions SERQUAL.

Questions	Answer	n	%
Tangible			
The health center provides medicine and vitamins for free, according to the complaints experienced.	Disagree	8	8%
	Agree	92	92%
Get a free swab test at the *Puskesmas*.	Disagree	23	23%
	Agree	77	77%
My family/close contact got a free swab test at the *Puskesmas*.	Disagree	15	15%
	Agree	85	85%
Officers should have a professional appearance (wearing PPE, ID, etc.) when conducting home visits.	Disagree	16	16%
	Agree	84	84%
Reliability			
The staff is skilled in explaining the needs of the self-isolation period.	Disagree	12	12%
	Agree	88	88%
Reliable service personnel	Disagree	11	11%
	Agree	89	89%
Officers provide immediate service.	Disagree	16	16%
	Agree	84	84%
Officers have the readiness to answer questions asked	Disagree	10	10%
	Agree	90	90%
The staff is skilled in explaining how to use the drug.	Disagree	13	13%
	Agree	87	87%
The services received are as promised (fulfillment of swabs, drugs, vitamins).	Disagree	10	10%
	Agree	90	90%
Responsiveness			
Officers are quick to respond to complaints experienced.	Disagree	14	14%
	Agree	86	86%
The officers quickly responded to my request regarding the need for self-isolation.	Disagree	16	16%
	Agree	84	84%
The staff is skilled and capable of serving my needs during self-isolation.	Disagree	14	14%
	Agree	86	86%
The officers were willing to help me during my self-isolation period.	Disagree	13	13%
	Agree	87	87%
The staff is prepared to respond to my request during self-isolation.	Disagree	15	15%
	Agree	85	85%
The officer kept telling me when the service would be provided (swab schedule, medication, and vitamins).	Disagree	13	13%
	Agree	87	87%
Assurance			
The *Puskesmas* provides good security for my data	Disagree	13	13%
	Agree	87	87%
The medicine and vitamins that were given were adequate for the symptoms I was experiencing.	Disagree	10	10%
	Agree	90	90%
Officers can serve patients properly and politely during the self-isolation period.	Disagree	10	10%
	Agree	90	90%
The officers carried out health protocols so that I felt safe.	Disagree	8	8%
	Agree	92	92%
The officers grew my confidence during the self-isolation service.	Disagree	14	14%
	Agree	86	86%
Empathy			
The officers took individual care during the self-isolation period.	Disagree	19	19%
	Agree	81	81%
The staff is friendly.	Disagree	7	7%

https://doi.org/10.33086/jhs.v17.i01.4328

The officers monitored my condition every day during the self-isolation period.	Agree	93	93%
	Disagree	25	25%
The staff served me with great care during the self-isolation period.	Agree	75	75%
	Disagree	18	18%
Officers prioritize patients during the self-isolation period.	Agree	82	82%
	Disagree	22	22%
	Agree	78	78%

The analysis results in Table 2 show that in the tangible dimension, 92% of patients stated that they had been provided medicine and vitamins according to the complaints experienced for free. Still, as many as 23% of patients need a free swab test at the *Puskesmas*. Then, in the reliability dimension, 90% agreed that officers were ready to answer questions and decided that they had received what was promised (fulfillment of swabs, drugs, vitamins). Still, as many as 16% of patients stated that officers did not provide immediate service.

Furthermore, 87% of patients agreed with the statements in the responsiveness dimension. The officers were willing to help me during my self-isolation period, and the officer kept telling me when the service would be provided (swab schedule, medication, and vitamins). However, 15% of patients disagreed that the staff was prepared to respond to my request during self-isolation.

In the assurance dimension, 92% of patients agreed with the statement that the officers carried out health protocols so that patients felt safe. However, 14% of patients disagreed with the statement that the officers grew their confidence during the self-isolation service. Then, in the empathy dimension, 93% of patients agreed that the staff was friendly. However, 25% of patients disagreed with the statement. The officers monitored my condition every day during the self-isolation period.

Table 3 Frequency Distribution of Respondents' Satisfaction with Monitoring Services from the Health Center

Respondent's Satisfaction	n	%
Not satisfied	12	12%
Satisfied	88	88%
Total	100	100%

Based on the analysis results in Table 3, it can be concluded that most respondents are satisfied with the COVID-19 self-isolation monitoring service from the *Puskesmas*, namely 88% of 100 respondents.

Table 4 Relationship of Patient Characteristics with Patient Satisfaction

Relationship	p-Value	OR (CI 95%)[1]
Age with patient satisfaction	0,321	0,256 (0,217 – 3,058)
Gender with patient satisfaction	0,990	1,221 (0,360 – 4,144)
Education level with patient satisfaction	0,213	2,857 (0,589 – 13,859)
Job-status with patient satisfaction	0,017	-
Monthly income with patient satisfaction	0,097	5,982 (0,737 – 48,529)

As the table above shows, only job status can affect the satisfaction of COVID-19 self-isolation patients at the *Puskesmas* with a p-value of 0.017 (p-value < 0.005).

https://doi.org/10.33086/jhs.v17.i01.4328

Table 5 Relationship of SERVQUAL Dimensions with Patient Satisfaction

Relationship	p-Value	OR (CI 95%)
Tangible dimension with patient satisfaction	0,001	-
Reliability dimension with patient satisfaction	0,001	-
Responsiveness dimension with patient satisfaction	0,001	174,000 (17,309 – 1749,181)
Assurance dimension with patient satisfaction	0,001	-
Empathy dimension with patient satisfaction	0,001	23,240 (5,397 – 100,072)

Table 5 illustrates that all dimensions within the SERVQUAL framework are intricately linked to patient satisfaction during self-isolation. This observation underscores the interdependence of these service quality dimensions in shaping the overall level of satisfaction experienced by individuals undergoing self-isolation. It emphasizes the significance of addressing and enhancing each dimension within the healthcare system to meet and surpass patient expectations, ultimately contributing to a more positive and fulfilling experience for those in self-isolation.

DISCUSSION

This study has uncovered significant findings regarding patient satisfaction and its influencing factors. Firstly, it has identified a substantial correlation between employment status and patient contentment, aligning with previous research findings (Rizal and Jalpi, 2018). Secondly, the study underscores the significance of the reliability dimension in service quality, emphasizing the importance of healthcare providers delivering services as promised, promptly, accurately, and satisfactorily (Zeithaml and Parasuraman, 2004). Notably, the responsive and empathetic dimensions, as integral components of the SERVQUAL model, exhibit a strong connection to patient satisfaction, supported by recent studies (Marzuq and Andriani, 2022; Saputra and Ariani, 2019). Consequently, healthcare institutions must prioritize the quality of their services in these dimensions to ensure a positive patient experience and higher satisfaction levels. The analysis results indicate that patients who receive effective monitoring services in the responsiveness dimension are 174 times more likely to report increased satisfaction with the COVID-19 self-isolation monitoring services provided by the health center.

A patient or service recipient needs services that can provide support, friendly and polite service, exemplary attention by officers, and responsive officers so that patients will feel helped and satisfied while receiving the services provided (Hermansyah and Darmana, 2019). For this reason, the responsiveness dimension requires more attention from health service providers to achieve patient satisfaction. However, in the field, some patients feel that officers need to be more responsive in serving patients, especially on holidays, and tend to be indifferent to the problems felt by patients.

This study also states a significant relationship between service quality in the assurance dimension and patient satisfaction. The assurance dimension is the ability of health service providers to provide guarantees on their services, including politeness, trustworthiness, knowledge, and staff skills, so that

patients are free from danger (Setyawan et al., 2019). However, according to observations in the field, some patients feel insecure regarding personal information, such as cellphone numbers, because several parties contact them. Maintaining communication between only two directions is better so that patients can feel safe regarding their data.

This study shows that patients in the empathy dimension are 23.240 times more likely to be satisfied with the COVID-19 self-isolation monitoring services received from the health Center. The empathy dimension is an essential Servqual dimension. Getting psychological attention from officers can affect the satisfaction felt by patients with the services received and be able to reduce the level of stress that patients may experience while undergoing the process from illness to recovery (Rizal et al., 2021).

According to the results of observations, some patients felt less cared for by officers while undergoing a period of independent isolation and felt that there was uneven service. In addition, respondents also felt difficulties in psychological terms during self-isolation, so patients also expected attention and encouragement in psychological terms from health workers to patients.

CONCLUSION

An impressive 88% of respondents expressed satisfaction with self-isolation monitoring services. Notably, there was a significant association between employment status (p-value = 0.017) and each dimension of service quality (p-value = 0.001) with patient satisfaction. The study aimed to gauge patient satisfaction with self-isolation services, highlighting the highest satisfaction levels when the health center provided medicines and vitamins according to complaints, was ready to answer questions, served patients with politeness, and maintained a friendly staff. Conversely, lower satisfaction levels were observed when officers monitored conditions daily during self-isolation, access to free swab tests was challenging, and patient prioritization needed improvement. Addressing these areas of concern is vital to enhance patient satisfaction during self-isolation, leading to an improved patient experience overall.

REFERENCES

Adzania, F.H., Fauzia, S., Aryati, G.P., Mahkota, R., 2021. Sociodemographic and environmental health risk factor of COVID-19 in Jakarta, Indonesia: An ecological study. One Health 13, 100303.

Al-Abri, R., Al-Balushi, A., 2014. Patient satisfaction survey as a tool for quality improvement. Oman Medical Journal 29, 3.

Annur, C.M., 2021. 2.700 Pasien Meninggal Saat Isoman, DKI Jakarta Terbanyak [WWW Document]. Data book. URL https://databoks.katadata.co.id/datapublish/2021/07/27/laporcovid-2700-pasien-meninggal-saat-isoman-dki-jakarta-terbanyak (accessed 1.24.24).

Caraka, R.E., Lee, Y., Kurniawan, R., Herliansyah, R., Kaban, P.A., Nasution, B.I., Gio, P.U., Chen, R.C., Toharudin, T., Pardamean, B., 2020. Impact of COVID-19 large scale restriction on

environment and economy in Indonesia. Global Journal of Environmental Science and Management 6, 65–84.

Crane, H.M., Lober, W., Webster, E., Harrington, R.D., Crane, P.K., Davis, T.E., Kitahata, M.M., 2007. Routine collection of patient-reported outcomes in an HIV clinic setting: the first 100 patients. Current HIV research 5, 109–118.

Hermansyah, H., Darmana, A., 2019. Analisis Faktor Yang Memengaruhi Kualitas Pelayanan Kesehatan Dengan Metode Servqual Di Puskesmas Wilayah Kerja Dinas Kesehatan Aceh Timur Tahun 2018. Health Care: Jurnal Kesehatan 8, 58–69.

Kolasa, K., Kozinski, G., 2020. How to Value Digital Health Interventions? A Systematic Literature Review. International Journal of Environmental Research and Public Health 17, 2119. https://doi.org/10.3390/ijerph17062119

Kompas Cyber, 2021. Hundreds of Covid-19 Patients Died During Independent Isolation and Efforts to Handle It [WWW Document]. KOMPAS.com. URL https://nasional.kompas.com/read/2021/07/06/09514311/ratusan-pasien-covid-19-meninggal-saat-isolasi-mandiri-dan-upaya (accessed 9.25.22).

Marzuq, N.H., Andriani, H., 2022. Hubungan Service Quality terhadap Kepuasan Pasien di Fasilitas Pelayanan Kesehatan: Literature Review. Jurnal Pendidikan Tambusai 6, 13995–14008.

Minister of Health of the Republic of Indonesia. COVID-19, 2022. Jakarta COVID-19 Response Team [WWW Document]. COVID-19 Emergency Service. URL https://corona.jakarta.go.id/en (accessed 9.24.22).

Minister of Health of the Republic of Indonesia. COVID-19, 2021. Infeksi Emerging [WWW Document]. URL https://infeksiemerging.kemkes.go.id/ (accessed 9.28.22).

Ministry of Health Indonesia, 2020. Circular Letter No. HK 02.01 /Menkes/202/2020.

Rizal, A., Jalpi, A., 2018. Analisis Faktor Internal Penentu Kepuasan Pasien Puskesmas Kota Banjarmasin. AL ULUM: JURNAL SAINS DAN TEKNOLOGI 4, 1–6. https://doi.org/10.31602/ajst.v4i1.1553

Rizal, F., Marwati, T.A., Solikhah, S., 2021. Dimensi Kualitas Pelayanan Dan Dampaknya Terhadap Tingkat Kepuasan Pasien: Studi Di Unit Fisioterapi. Jurnal Kesmas (Kesehatan Masyarakat) Khatulistiwa 8, 54–62.

Saputra, A., Ariani, N., 2019. Hubungan Mutu Pelayanan Kesehatan Dengan Kepuasaan Pasien Rawat Jalan Pengguna Kartu Bpjs Di Rumah Sakit Daerah Idaman Kota Banjarbaru. Borneo Nursing Journal (BNJ) 1, 48–60.

Setyawan, F.E.B., Supriyanto, S., Tunjungsari, F., Hanifaty, W.O.N., Lestari, R., 2019. Medical staff services quality to patients satisfaction based on SERVQUAL dimensions. International Journal of Public Health Science (IJPHS) 8, 51–57.

Teisberg, E., Wallace, S., O'Hara, S., 2020. Defining and implementing value-based health care: a strategic framework. Academic Medicine 95, 682.

Zaid, A.A., Arqawi, S.M., Mwais, R.M.A., Al Shobaki, M.J., Abu-Naser, S.S., 2020. The impact of Total quality management and perceived service quality on patient satisfaction and behavior intention in Palestinian healthcare organizations. Technology Reports of Kansai University 62, 221–232.

Zeithaml, V.A., Parasuraman, A., 2004. Service quality. Cambridge, MA.

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Application of the Health Belief Model to Compliance with the Use of Personal Protective Equipment by Laundry Staff: A Systematic Literature Review

Irvan Maulana[1], *Eko Winarti*[2], *Norfidah Mohamad*[3]

[1] *Master of Public Health Study Program, Faculty of Health Sciences, Kadiri University, Kediri City, East Java, Indonesia*
[2] *Faculty of Health Sciences, Kadiri University, Kediri City, East Java, Indonesia*
[3] *Centre for Nursing Studies, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Puncak Alam, Selangor, Malaysia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Health Belief Model; Personal Protective Equipment; Laundry Staff

CORRESPONDENCE

E-mail: irvanmaulana1986@gmail.com

A B S T R A C T

Personal protective equipment is essential to safeguard workers from potential hazards in the workplace, including chemicals, dust, heat, or germs. The proper use of personal protective equipment can prevent or reduce injuries and illnesses at work. The goal of this literature review is to explore research on the utilization of personal protective equipment by hospital laundry workers based on the health belief model.
The systematic literature review is the chosen method for conducting this study. It is a scientific approach employed to analyze, assess, synthesize, and critique research findings on specific themes or issues. To enhance compliance with personal protective equipment among laundry personnel, it is crucial to elevate knowledge and awareness, address unfavorable attitudes or perceptions, provide resources and comfort, implement adequate supervision and procedures, and foster a supportive organizational culture.
Healthcare organizations can promote adherence to personal protective equipment guidelines among laundry staff by offering instruction and training, facilitating communication and awareness, providing administrative support, enforcing oversight, setting positive role models, continuously evaluating, and improving procedures, engaging employees, and ensuring ongoing support and resources.

INTRODUCTION

Personal protective equipment is used to protect workers from danger in the workplace, such as chemicals, dust, heat, or germs. Injury or illness at work can be prevented or reduced by using personal protective equipment (Dickson, 2012). Laundry staff, who are in charge of washing, drying, ironing, and storing filthy garments from patients or hospital employees, is one occupation requiring personal protective equipment (Verbeek *et al.*, 2020). The risk of exposure to blood, body fluids, or other infectious agents that can cause hepatitis B, hepatitis C, HIV/AIDS, or tuberculosis exists for laundry staff. As a result, laundry employees must wear personal protective equipment such as gloves, masks, aprons, and boots (Environmental Health and Safety, 2018).

Some studies show that the personal protective equipment used by laundry staff still needs to be higher and per standards. For example, a Nigerian study found that only 38% of laundry staff wear gloves, and 18% wear masks while working (Omoijiade and Evbuomwan, 2019). Research in India also reported that only 50% of laundry staff wear gloves, and 25% use masks (Workers et al., 2015). While research in Indonesia was written by Sari and Maulida Sari (2020) the analysis shows that the usage of personal protective equipment by staff in Haji Medan Hospital is primarily a private matter, which is connected to volume and depth of work. Content is concerned with discomfort and disgust on the psychological side,

https://doi.org/10.33086/jhs.v17.i01.4408

as well as facilities, socialization, and control on the organizational side. Because some employees still choose not to wear personal protective equipment, decide not to wear it depending on the work environment, or only use it when it is hot and uncomfortable, the compliance of employees at Haji Medan Hospital with the use of personal protective equipment is still comparatively low. Factors that affect laundry staff's use of personal protective equipment include knowledge, attitude, availability of personal protective equipment, supervision, and motivation (Istigfari, 2022). The health belief model is a theory that may be applied to analyze these variables. An explanation for a person's health behavior based on belief or perception about the risk of disease and advantages of taking preventative measures is provided by the health belief model, a psychosocial theory by Karen Glanz, Barbara K. Rimer, K. Viswanath, Karen Glanz, Barbara K. Rimer, (2015). The six basic constructs of the health belief model are perceived perception of their vulnerability to illness and opinion of the disease's severity, known as their perceived susceptibility. A person's view of the advantages of preventive measures is known as the perceived benefit; a person's impression of barriers or challenges when implementing preventive measures; a trigger to action is an internal or external motivator for taking preventative action; and self-efficacy refers to one's perceptions of their capacity to take preventative action (Berhimpong, Rattu and Pertiwi, 2020).

Research on using personal protective equipment in hospital laundry personnel according to the health belief model still needs to be made available. Therefore, this systematic literature review examines the research on how to apply the health belief model to the use of personal protective equipment by hospital laundry personnel. In addition to recommending practical interventions to increase compliance with the use of personal protective equipment by hospital laundry staff, this study is expected to provide an overview of the factors that affect hospital laundry staff behavior when wearing personal protective equipment.

METHOD

The systematic literature review is a method that is applied to conduct this study. Systematic literature review is a scientific method for analyzing, assessing, synthesizing, and critiquing research findings on themes or issues. Research on how to apply the health belief model to laundry employees over personal protective equipment usage is the basis for the chosen article or journal. The selected articles/journals are the results of the health belief model, personal protective equipment, and laundry staff. The inclusion criteria are an article about the health belief model and personal protective equipment. This article discusses the health belief model and laundry staff, an article that discusses personal protective equipment and laundry staff, an article from research results in the form of systematic review, meta-analysis, scoping review, or concept analysis, an article published in English or Indonesian from 2019 to 2023, and an

https://doi.org/10.33086/jhs.v17.i01.4408

article available in full text. The exclusion criteria used in this article are an article that does not correlate with the research topic, an article published in 2019, and an article not available in full text.

Several journal databases, including Google Scholar and Science Direct, were searched for articles using the terms "health belief model," "personal protective equipment," and "laundry staff." Based on the results of a literature search through publications in two databases (Google Scholar and Science Direct) and using customized keywords, researchers found 49 articles that matched these keywords. The search results that have been obtained are then checked for duplication and found that there are no similar articles. The researcher then screened using the Screening Record technique using inclusion criteria (n = 28), reviewed the articles for eligibility by downloading and reading the full-text articles (n = 13), and finally obtained several suitable articles. According to the library research theme, the study included evidence mapping (n = 5). The assessment was based on the adequacy of the inclusion and exclusion criteria obtained from as many as five articles that could be used in this literature review.

RESULT

Table 1 Article Result

No	Title and Author	Purpose	Method	Result
1	Factors Behind Non-Compliance with the Use of Complete Personal Protective Equipment for Laundry Staff at RSUD Idaman Kota Banjarbaru in 2021 (Anggraeni et al., 2021)	This study aims to determine the factors behind non-compliance with the use of complete personal protective equipment by laundry staff at Banjarbaru City Hospital in 2021.	Types of qualitative research with a phenomenological approach. Informant determination using purposive sampling was used in this study with laundry staff and the linen coordinator. Data collection techniques conducted by interviews (In-depth interviews)	The research results in this article show that the internal factors, namely the non-compliance of laundry staff with complete personal protective equipment, are knowledge and attitudes. In contrast, the external factor of non-compliance of laundry staff with complete personal protective equipment and the comfort of using personal protective equipment includes regulations on personal protective equipment. Monitoring of personal protective equipment and the environment
2	Analysis of Adherence to the Use of Personal Protective Equipment in Laundry Installation Workers at the Hajj General Hospital Medan (Sari and Maulida Sari, 2020)	This study was conducted to determine the adhesion of personal protective equipment usage among laundry installation workers at the Haji Medan General Hospital.	The research method carried out is the qualitative method, with research informants being workers in the laundry installation of the Haji Medan General Hospital.	The analysis results show that using personal protective equipment for workers at Medan Hajj Hospital is an individual aspect of the length of work and knowledge. The most dominant element for workers using personal protective equipment is the organizational aspect, namely the available facilities and supervision from the leadership and supervisory sections' use of personal protective equipment while working.

https://doi.org/10.33086/jhs.v17.i01.4408

3	The relationship between characteristics, knowledge, attitudes, and supervision in compliance with the use of personal protective equipment in laundry staff (Study at RS. X Lampung Province) (Tri Puji Astuti, Ida Wahyuni, 2019)	The purpose of this study is to analyze the relationship between worker behaviors and compliance with personal protective equipment by laundry staff in Hospital X Lampung Province.	The type of research used quantitative, using cross-sectional studies. The population in this study was all workers at laundry installation. The sample in this study was 21 people, and a total sampling technique was used.	Based on the results of the research that has been conducted, it can be concluded that characteristics of respondents in the laundry staff are mainly in the category of older adults (71.4%) with a high school education level (71.4%) and a long working period (66.7%). There is no significant relationship between age, education, length of service, and personal protective equipment compliance among laundry installation staff. An essential relationship exists between supervision and compliance with personal protective equipment used by laundry installation personnel.
4	The influence of knowledge, motivation, and risk perception on behavior use of essential personal protective equipment Moderated by Supervisory Factors at Civitas Hospital RSGMP Unsoed (Chotimah, Haryadi and Roestijawati, 2019)	The purpose of this study is to determine the influence of knowledge, motivation, and risk perception about the use of essential personal protective equipment on the behavior of using crucial personal protective equipment moderated by supervisory factors in the hospital community of RSGMP Unsoed	Respondents in this study were 127 people with proportionate random sampling techniques who were interviewed with instruments in the form of questionnaires. The analysis tool for this research is moderating regression (Moderating Regression Analysis) by utilizing the SPSS program.	The results show that knowledge, motivation, and perception influenced basic personal protective equipment use behavior. Supervision moderates the influence of knowledge and motivation on basic personal protective equipment use behavior. Still, it does not moderate the effect of risk perception on basic personal protective equipment use behavior.
5	The relationship between safety perception and compliance with the use of personal protective equipment (Health Belief Model Theory Approach) in Nurses of the Surabaya Hajj General Hospital (Artono, 2020)	The purpose of this study is to analyze the relationship between perception and compliance with the use of personal protective equipment (health belief model theory approach) in nurses at RSU Haji Surabaya.	This study is a type of observational study with a cross-sectional research design. The population of this study was all nurses on duty at the Al-Aqso Inpatient Installation of RSU Haji Surabaya, with a total sample of 33 people using entire sampling techniques and data taken by distributing questionnaires and making observations. Data analysis was carried out by looking at the values of the contingency coefficient and PH coefficient.	The results showed that 66.7% of nurses were categorized as moderately compliant, and 33.3% were categorized as good at using personal protective equipment. The results also show the health belief model perception variable with compliance variable was severity perception (phi = -0.328), and the characteristic variable with the most vital relationship was the sex variable (phi = -0.326). This study concludes that the level of nurse compliance with personal protective equipment is relatively low, and positive perceptions do not always increase compliance behavior.

https://doi.org/10.33086/jhs.v17.i01.4408

DISCUSSION

Factors contributing to the laundry staff in RSUD Idaman Kota Banjarbaru are Non-Compliance with the use of complete personal protective equipment (Anggraeni *et al.*, 2021). The study results reveal internal and external factors that affect laundry staff's compliance with personal protective equipment. The inner components found, such as knowledge and attitudes, are consistent with research by Sari and Maulida Sari, (2020), which underlines the importance of individual factors in personal protective equipment compliance. Additionally, research by Chotimah, Haryadi, and Roestijawati, (2019) supports the notion that knowledge significantly impacts how people use personal protective equipment. The significance of outside elements, such as the accessibility and practicality of personal protective equipment, supports research by Sari and Maulida Sari, (2020) emphasizing the importance of organizational support in fostering compliance. Analysis of laundry installation workers compliance use of personal protective equipment at the Haji Medan General Hospital. The study (2020) sheds light on the variables influencing employees' adherence to unique laundry installation protective equipment regulations. Based on previous studies, including work by Anggraeni *et al.* (2021), the emphasis on individual aspects like the length of labor and knowledge is constant. Additionally, the importance of organizational elements, particularly facilities, and supervision, is consistent with the study by Chotimah, Haryadi, and Roestijawati, (2019) which highlights the importance of supervision in affecting wearers' behavior to use personal protective equipment. The correlation between individual protective equipment compliance and laundry personnel's characteristics, knowledge, attitudes, and supervision (Tri Puji Astuti, Ida Wahyuni, 2019). The study emphasizes the connection between several parameters and laundry staff compliance with wearing personal protective equipment. Although the results indicated that factors like age, education, and length of service did not significantly affect compliance, the significant relationship between supervision and compliance was consistent with other studies' findings, including those of Chotimah, Haryadi, and Roestijawati (2019). These results suggest that monitoring plays a vital role in promoting adherence to personal protective equipment guidelines.

Hospital RSGMP Unsoed use of essential personal protective equipment was influenced by knowledge, motivation, and risk perception, with supervisory variables acting as moderators (Chotimah, Haryadi, and Roestijawati, 2019). The research by Chotimah, Haryadi, and Roestijawati (2019) sheds light on how knowledge, motivation, risk perception, and supervision affect wearers' decisions to wear personal protective equipment. This result is consistent with studies by Anggraeni *et al.* (2021), which underline the value of education and supervision in encouraging adherence to personal protective equipment. The results of this study are also consistent with the moderating role that supervision plays in the interaction between knowledge, motivation, and conduct related to personal protective equipment. The correlation between nurses at Haji General Hospital Surabaya's perceptions of safety and their adherence use of

personal protective equipment. Artono's study (Artono, 2020) focused on the connection between nurses' attitudes toward safety and their use of personal protective equipment. Despite not directly examining the same components as other research we analyzed, this study offers important new information about how safety perceptions affect compliance behavior. According to research by Anggraeni *et al.* (2021), which emphasized the complex interaction of internal and external factors impacting personal protective equipment compliance, the conclusion is that favorable safety perceptions do not always correlate with higher compliance. These studies demonstrate the diversity of factors that influence personal protective equipment compliance by healthcare workers. This study's results highlight the significance of considering both organizational and individual elements, such as surveillance and the availability of personal protective equipment, as unique aspects, such as knowledge, attitudes, and perceptions of safety. Future studies should focus on incorporating these elements into holistic treatments that successfully encourage a culture of personal protective equipment compliance and enhance the safety of health workers. The findings of Anggraeni *et al.* (2021), the causes of laundry staff members' non-compliance with personal protective equipment usage are consistent with the tenets of the Health Belief Model. The health belief model's emphasis on individual beliefs and perceptions as determinants of health-related behaviors is congruent with identifying internal components, such as knowledge and attitudes. Research by Chotimah, Haryadi, and Roestijawati (2019), as well as Sari and Maulida Sari (2020), also highlighted the impact of individual characteristics, particularly knowledge, on personal protective equipment compliance, research that supports the conclusions of this study. Additionally, the survey by Anggraeni *et al.* (2021) illustrates the organizational support element of the health belief model by recognizing external elements such as the accessibility and ease of personal protective equipment. A supportive environment and the availability of required resources are just two examples of external cues for action that the health belief model acknowledges are crucial in fostering health-related behaviors. In general, the study's findings by Anggraeni *et al.* (2021) reinforce the Health Belief Model's applicability in understanding the variables that contribute to noncompliance with the use of personal protective equipment. Interventions can be created to address these factors and encourage compliance with individual protective equipment procedures among laundry personnel by considering internal variables (knowledge and attitudes) and external factors (availability and comfort of personal protective equipment).

Another research that related to this research is by Istigfari et al. The study presented in this article aimed to identify the effectiveness of the human factor design method in improving personal protective equipment compliance among health workers. The literature review of six articles showed that human factor design is an effective intervention that can improve individual protective equipment compliance by considering physical, cognitive, and organizational domains. The study recommended several strategies, such as standardization and dissemination of care through comprehensive information with poster media,

educational videos, and supervision to improve personal protective equipment compliance among hospital health workers. From a researcher's perspective, the study contributes to the growing literature on infection control and prevention among health workers. The findings suggest that the human factor design method can effectively improve personal protective equipment compliance by addressing various factors that influence health worker behavior. This approach aligns with the principles of systems thinking, which recognizes that complex problems require holistic solutions considering multiple factors. However, it is essential to acknowledge some limitations of this study. The literature review only included articles published between 2012 and 2021 and written in Indonesian or English. This may limit the generalizability of the findings to other languages or periods. The sample size of six articles may be representative of only some relevant studies on personal protective equipment compliance among health workers. However, this study provides valuable insights into effective interventions for improving individual protective equipment compliance among hospital health workers. The strategies recommended in this study are practical and engaging for health workers, which can increase their motivation to comply with the use of personal protective equipment. Further research is needed to explore the effectiveness of these strategies in different settings and populations. This study highlights the importance of developing effective infection control and prevention interventions among health workers. The human factor design method is a promising approach that considers various factors influencing health worker behavior and can improve personal protective equipment compliance. Future research should continue to explore innovative strategies for improving infection control practices among health workers.

CONCLUSION

The literature review in this outline is variables influencing laundry personnel in healthcare settings to adhere to personal protective equipment. There are some universal findings and themes despite each study approaching the subject from a different standpoint and employing a different research methodology. Internal variables are Compliance with the use of personal protective equipment is significantly influenced by knowledge, attitudes, and perceptions. Studies repeatedly demonstrate that a lack of understanding of personal protective equipment’s significance and unfavorable attitudes or perceptions towards it can lead to non-compliance. An organization's support is essential to encourage compliance, including availability of personal protective equipment, comfort, and supervision. According to studies, the availability of sufficient resources, efficient supervision, and promoting policies and regulations substantially impact how well personal protective equipment standards are followed. The ideas of the Health Belief Model, which emphasizes the relevance of individual beliefs and perceptions in forming health-related behavior, are consistent with the findings of several studies. Knowledge, attitude, risk perception, and organizational support are all factors that enable the development of a health belief model. Overall, the research reviewed

https://doi.org/10.33086/jhs.v17.i01.4408

highlights the variety of factors influencing adherence to the use of personal protective equipment. They emphasized the significance of addressing internal (such as knowledge and attitudes) and external (such as availability of personal protective equipment and organizational support) elements in interventions that foster individual protective equipment compliance among health workers. Providing adequate resources and comfort for personal protective equipment, addressing negative attitudes or perceptions towards personal protective equipment, implementing adequate supervision and policies, and developing a supportive organizational culture are critical components of improving individual protective equipment compliance among laundry staff. Including these elements in complete interventions can help create safer workplaces and better safeguard health professionals.

REFERENCES

Anggraeni, S. *et al.* (2021) 'Faktor Yang Melatarbelakangi Ketidakpatuhan Penggunaan Alat Pelindung Diri Lengkap Pada Petugas Laundry Di RSUD Idaman Kota Banjarbaru Tahun 2021'. Available at: http://eprints.uniska-bjm.ac.id/8634/ (Accessed: 31 May 2023).

Artono, A. (2020) 'Hubungan Persepsi Keselamatan Dengan Kepatuhan Penggunaan Alat Pelindung Diri (Pendekatan Teori Health Belief Model) Pada Perawat Rumah Sakit Umum', *Jurnal Imejing Diagnostik*, 8, pp. 65–74. Available at: https://repository.unair.ac.id/95031/ (Accessed: 24 May 2023).

Berhimpong, M.J.A., Rattu, A.J.M. and Pertiwi, J.M. (2020) 'Analisis Implementasi Aktivitas Fisik Berdasarkan Health Belief Model oleh Tenaga Kesehatan di Puskesmas', *Journal of Public Health and Community Medicine,* 1(4), pp. 54–62.

Chotimah, C.C., Haryadi, H. and Roestijawati, N. (2019) 'Pengaruh Pengetahuan, Motivasi Dan Persepsi Risiko Terhadap Perilaku Penggunaan Alat Pelindung Diri Dasar Yang Dimoderasi Faktor Pengawasan Pada Civitas Hospitalia RSGMP UNSOED', *Jurnal Ekonomi, Bisnis, dan Akuntansi*, 21(3). Available at: https://doi.org/10.32424/jeba.v21i3.1367.

Dickson, E.F.G. (2012) *Personal Protective Equipment For Chemical, Biological, And Radiological Hazards - Design, Evaluation, and Selection*. Kingston, Ontario, Canada: John Wiley & Sons, Inc., Hoboken, New Jersey.

Environmental Health and Safety (2018) 'Personal Protective Equipment Manual Equipment (PPE)', pp. 1–36.

Istigfari, L.D. (2022) 'Kepatuhan Penggunaan Alat Pelindung Diri pada Petugas Kesehatan di Rumah Sakit melalui Pengembangan Metode Human Factor Design: Kajian Literatur', *ejournal2.undip.ac.id*, 5(1), pp. 111–124. Available at: https://ejournal2.undip.ac.id/index.php/hnhs/article/download/14908/7622 (Accessed: 31 May 2023).

Istigfari, L.D. *et al.* (2022) 'Kepatuhan Penggunaan Alat Pelindung Diri pada Petugas Kesehatan di Rumah Sakit melalui Pengembangan Metode Human Factor Design: Kajian Literatur', *Holistic Nursing and Health Science*, 5(1), pp. 111–124. Available at: https://ejournal2.undip.ac.id/index.php/hnhs/article/download/14908/7622 (Accessed: 31 May 2023).

Karen Glanz, Barbara K. Rimer, K. Viswanath, Karen Glanz, Barbara K. Rimer, K.V. (2015) *Health*

Behavior Theory, Research, and Practice 5th edition. 5th editio. Available at: https://www.perlego.com/book/996608/health-behavior-theory-research-and-practice-pdf.

Omoijiade, E.N. and Evbuomwan, L. (2019) 'Personal protective equipment compliance among laundry workers in secondary and tertiary health facilities in {Nigeria}', *International Journal Of Community Medicine And Public Health*, 6(3), p. 936. Available at: https://doi.org/10.18203/2394-6040.ijcmph20190575.

Sari, R.M.R.R.M. and Maulida sari, R. (2020) *Analisis Kepatuhan Pemakaian Alat Pelindung Diri Pada Pekerja Instalasi Laundry di Rumah Sakit Umum Haji Medan*, *Braz Dent J.* Universitas Islam Negeri Sumatera Utara. Available at: http://repository.uinsu.ac.id/id/eprint/14409 (Accessed: 24 May 2023).

Tri Puji Astuti, Ida Wahyuni, S.J. (2019) 'Hubungan Karakteristik, Pengetahuan, Sikap Dan Pengawasan Dengan Kepatuhan Pemakaian Alat Pelindung Diri Pada Petugas Laundry (Studi di RS. X Provinsi Lampung)', *Jurnal Kesehatan Masyarakat (e-Journal)*, 7(3), pp. 39–46. Available at: http://ejournal3.undip.ac.id/index.php/jkm%0Asehingga.

Verbeek, J.H. *et al.* (2020) 'Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff', *Cochrane Database of Systematic Reviews*, 2020(4). Available at: https://doi.org/10.1002/14651858.CD011621.PUB4/ABSTRACT.

Workers, C. *et al.* (2015) 'Knowledge, Attitude and Practice of Standard Precautions among The Health Care Workers of a Tertiary Care Teaching Hospital of North India', *INTERNATIONAL JOURNAL OF CONTEMPORARY MEDICAL RESEARCH*, 2(5), pp. 1282–1285. Available at: https://www.researchgate.net/publication/308552684_Knowledge_Attitude_and_Practice_of_Standard_Precautions_among_The_Health_Care_Workers_of_a_Tertiary_Care_Teaching_Hospital_of_North_India.

Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya
ISSN 1978-6743
E-ISSN 2477-3948

The Effect of Giving Cinnamon Decoction Water on The Healing of Perineal Wounds of Postpartum Women at Sri Wahyuni's PMB and Erlia Saraswati's PMB

Nely Nilova Nalurita[1], Ani Media Harumi[2], Sukesi[3], Sherly Jeniawaty[4]

[1,2,3,4] *Poltekkes Kemenkes Surabaya, Surabaya, Indonesia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Cinnamon (Cinnamomum Burman), perineal wounds, postpartum women

CORRESPONDENCE

E-mail: nelynilova@gmail.com

A B S T R A C T

The puerperium is a sensitive time for mothers because they must care for themselves while recovering after giving birth and caring for their babies. So, a good and effective postpartum healing process can help the mother get through the puerperium. Perineal infection is a common infection in mothers after giving birth. Some literature shows that cinnamon has ingredients that can heal wounds. This study aims to see how the influence of cinnamon cooking water on the healing of perineal wounds in postpartum women. This quantitative study used a quasi-experimental design and a nonequivalent control group design approach. The population in this study were postpartum women who gave birth in March and April 2023, respectively. Using a purposive sampling approach, 60 respondents were selected and were divided into two groups. Observation sheets and checklists were used to collect data. Wilcoxon Signed Rank Test, and Mann Whitney U Test was used to analyze the data. The results showed that the average perineal wound healing in the control group was 1.60, while the average in the intervention group was 1.87. The Wilcoxon Sign Ranked Test results obtained a p-value (0.000), namely <0.05, which means there was a difference in wound healing before and after being given treatment for each group. Then, the results of the Mann-Whitney U Test obtained a p-value (0.021) <0.05, meaning there was a difference in wound healing between the treatment and control groups. So, the conclusion that can be made in this study is that giving cinnamon-boiled water affects the healing of perineal wounds in postpartum mothers.

INTRODUCTION

The postpartum healing process that is not maximized will affect the mother's health and the baby's health care. So, a good and effective healing process can help mothers get through the postpartum period. Cioffi Jane stated that the mother of Kala II experienced a tear in the birth canal while giving birth to a baby. Wounds can arise naturally or because of episiotomy (Darukshan and Grover, 2022). Based on (RCOG), 85% of women giving birth will experience perineal injury and will get perineal repair or suturing (60%-70%) (D'Souza, 2020).

Wound healing is the process of renewing and improving the function of damaged tissue (Rodrigues *et al.*, 2019). In postpartum women, many components need repair at different rates. Both internal and external causes influence perineal wound healing. Nutrition, personal hygiene, medical history, heritage, age, bleeding, hypovolemia, local edema, dietary deficiency, oxygen deficit, and excessive exercise are examples of internal variables. While external factors such as the environment, traditions, knowledge, society, economy, how to handle officers, how to handle tissues, and how to take drugs (Mukherjee, 2019). The process of repairing pre-pregnancy conditions, including healing episiotomy wounds, is usually only compressed with warm water, and many traditional plants and plants are helpful for wound

https://doi.org/10.33086/jhs.v17.i01.4519

healing, such as binahong leaf decoction and kersen leaf decoction (Christiani and Pane, 2023). In this study, researchers are interested in utilizing cinnamon.

Synthetic and natural medicines are forms of treatment that can be used to stop injured tissue from recovering from wounds. According to Khan and Ahmad (2019), natural drugs provide advantages over synthetic drugs, such as fewer side effects and cheaper rates. They are also easier to identify and purchase. In addition, some choose alternative therapies such as natural or herbal remedies to prevent side effects that are not anticipated by most synthetic drugs available on the market (Saggar *et al.*, 2022). Cinnamon is a widely used spice around the world. Cinnamon's many benefits include anti-inflammatory, antioxidant, and antimicrobial properties, as well as anti-pain and wound healing (Girsang and Elfira, 2023). The effects of its ethanol extract have been demonstrated in laboratory rats. Also, no significant adverse effects of cinnamon have been found in human studies (Hajimonfarednejad *et al.*, 2019). Secondary metabolite compounds contained in cinnamon plants, including flavonoids, tannins, saponins, alkaloids, and phenols, have medicinal uses for treating wounds (Saggar *et al.*, 2022).

Based on the above background, the study aims to determine the effect of giving cinnamon boiled water on the healing of perineal wounds in postpartum women.

METHOD

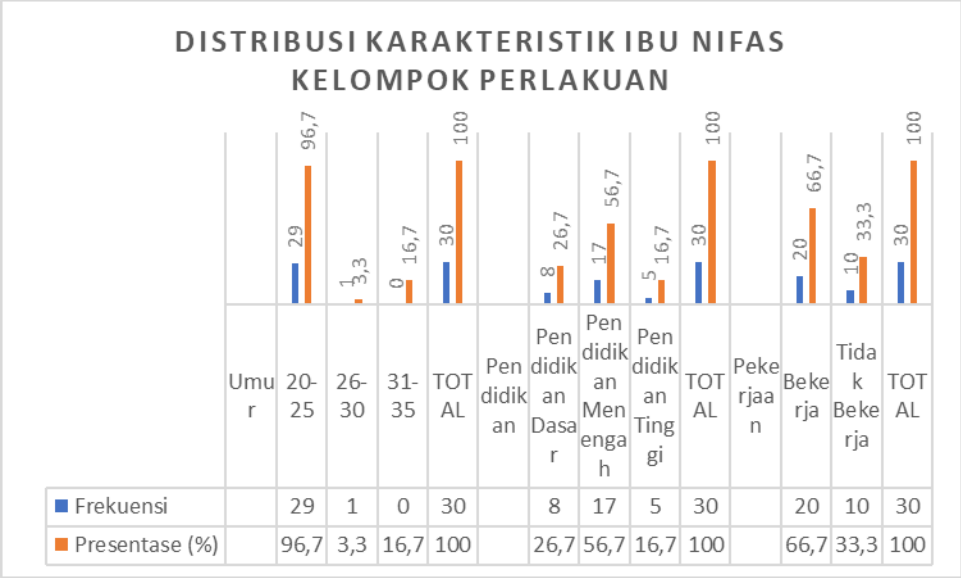
This quantitative research used a Quasi-Experimental design with a Non-Equivalent Control Group Design approach. The population of this study were postpartum mothers or mothers who met the inclusion criteria at PMB Sri Wahyuni and PMB Erlia Saraswati. Data was collected using a purposive sampling technique, which obtained a sample of 60 respondents divided into an intervention group of 30 people given cinnamon-boiled water. A control group of 30 people would be assigned wound care. The instruments used to collect data are observation sheets and checklists. To process the data that has been obtained, the analysis uses the Wilcoxon Sign Ranked Test and the Mann-Whitney U-Test test.

RESULT

General Data

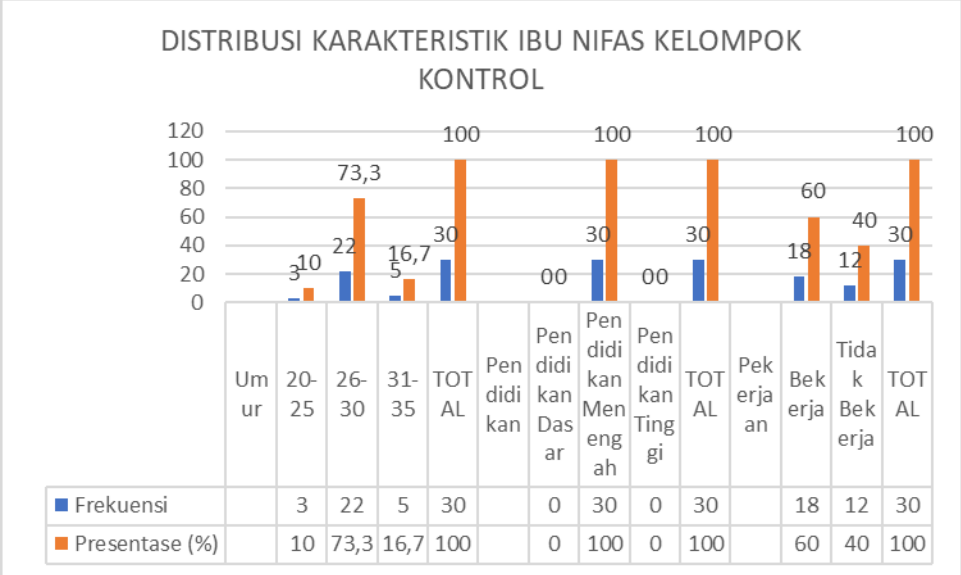
Table 1. Frequency Distribution of Respondent Characteristics of Postpartum Women in the TreatmentGroup at Sri Wahyuni Midwife Independent Practice March 2023 - April 2023

https://doi.org/10.33086/jhs.v17.i01.4519



It is known that the characteristics of the respondents of the postpartum women in the treatment group in this study are almost entirely aged 20-25, namely 29 mothers (96.7%), and a small proportion of others aged 26-30 years, namely one mother.

Table 2. Frequency Distribution of Respondents Characteristics of Postpartum Women Independent Practice Midwife Erlia Saraswati Research Location Period March 2023 - April 2023



It is known that the characteristics of postpartum women in the control group in this study were mostly aged 26-30 years, namely 22 postpartum women (73.3%).

https://doi.org/10.33086/jhs.v17.i01.4519

Special Data

Table 3. Wound Healing of Postpartum Women Before and After Giving Cinnamon Decoction Water at PMB Sri Wahyuni

Perineal Wound Healing	Treatment Group			
	Before		After	
	N	(%)	N	(%)
Good	0	0	26	86,7
Not Good	2	6,7	4	13,3
Bad	28	93,3	0	0
Total	30	100	30	100

It showed that poor wound healing decreased by (93.3%) after being given cinnamon-boiled water. For good wound healing, there was an increase of (86.7%), while for poor wound healing, there was an increase of (6.6%).

Table 4. Wound Healing of Postpartum Women Before and After Wound Care at Erlia Saraswati Maternity Hospital

Perineal Wound Healing	Control Group Wound Care			
	Before		After	
	N	(%)	N	(%)
Baik	0	0	18	60
Kurang baik	3	10	12	40
Buruk	27	90	0	0
Total	30	100	30	100

It showed that poor wound healing decreased by (90%) after wound care was given. For good wound healing, there was an increase of (60%), while for poor wound healing, there was an increase of (30%).

Table 5. Normality Test

Results	Statistic	Df	Sig.
Pre-Observation Treatment	0,537	30	0,000
Post Observation Treatment	0,517	30	0,000
Pre-Observation Control	0,528	30	0,000
Control Post Observation	0,389	30	0,000

In this study, the Kolmogorov Smirnov normality test obtained significant results on the pre and post-observation results in the treatment group, namely 0.000 and 0.000, which are <0.005. Hence, the data distribution is not normal. While the significance results on the pre and post-observation results in the treatment group are 0.000 and 0.000, the data distribution of this group is also not normal, so the *Wilcoxon Signed Rank Test* and *Mann-Whitney* test can be done.

Table 6. Wilcoxon Sign Ranked Test

	Treatment Group		Control Group	
	Before	After	Before	After
Mean	0,07	1,87	0,20	1,60
Standard Deviation	0,254	0,346	0,61	0,498
Wilcoxon Signed Rank Test	p= 0.000		p= 0.000	

Based on the results of research processed analytically with the *Wilcoxon Sign Ranked Test* in the treatment group given cinnamon boiled water, the *p-value* = 0.00 (<0.05) was obtained, indicating a

https://doi.org/10.33086/jhs.v17.i01.4519

significant effect on the perineal wound healing process after giving cinnamon boiled water. Similarly, *p-value* = 0.00 (<0.05) was found in the control group (wound care), indicating a significant effect on perineal wound healing after perineal wound care.

Table 7. Mann-Whitney U Test

Respondent Group	*Mean*	SD	*p*
Treatment Group	1,87	0,346	0,021
Control Group	1,60	0,498	

The difference in perineal wound healing between the treatment and control groups can be seen by comparing the mean post-observation scores in each group. The Mann-Whitney test calculates the mean difference since the samples were not normally distributed. Based on the table, the significance value was 0.021. Since the significance level is less than 0.05, the H0 option is rejected. This indicates that there is a substantial difference in perineal wound healing between the intervention group given cinnamon boiled water and the control group given perineal wound care in *postpartum* women.

DISCUSSION

1. Healing of Perineal Wounds of Postpartum Women Before and After Giving Cinnamon Decoction Water at PMB Sri Wahyuni in March-April 2023

The results showed that of the 30 respondents before being given cinnamon boiled water, most of the wound healing was poor and a small proportion of the wound healing was poor. After being given cinnamon boiled water, it was found that almost all respondents experienced good healing and a small portion of the wound healing was not good.

In this study, researchers used a 3g dose of cinnamon, twice that of previous researchers concerning the maximum dose; the amount of cinnamon used in several studies ranges from 1 to 6 grams. So, in the treatment group, in addition to being given antibiotics, analgesics, and wound care, cinnamon-boiled water will be provided, which must be consumed every day from day 1 to day 5 of the first postpartum period before eating in the morning. An evaluation of perineal wound healing will be carried out on day 6 of the postpartum period.

This can help postpartum women who experience episiotomy wounds to relieve pain and heal perineal wounds because this cinnamon spice has various health benefits, including analgesics and wound healing (Girsang and Elfira, 2023).

2. Healing of Perineal Wounds of Postpartum Women Before and After Giving Perineal Wound Care at PMB Erlia Saraswati in March-April 2023

The results showed that of the 30 respondents before wound care, most wound healing was poor, and a small proportion was poor. After being given wound care, half of the respondents experienced good

https://doi.org/10.33086/jhs.v17.i01.4519

healing, and almost half had poor wound healing. In the control group, after the respondent's consent, antibiotics, analgesics, and perineal wound care will be given as treatment for perineal wound healing of postpartum women on the 1st to 5th day of the postpartum period, then on the 6th day, the perineal wound healing of postpartum women will be evaluated. In this study, there was only a slight increase in favorable wound healing. The most popular medications to treat episiotomy pain are non-steroidal anti-inflammatory drugs, although these may have some adverse side effects, such as gastric ulcers. Iodine (Povidine) is also often. Betadine is used to treat episiotomy wounds and prevent infection. However, many studies have proven that betadine has no meaningful impact on the risk of infection (Slullitel *et al.*, 2020).

3. The Effect of Cinnamon Decoction Water on the Healing of Perineal Wounds of Postpartum Women

Based on the results of the analysis showed that the level of perineal wound healing in the group that had been given cinnamon decoction water almost entirely experienced good wound healing, and a small portion experienced poor wound healing. While in the group that had been given wound care most experienced good wound healing and almost half experienced poor wound healing.

The results of the analysis using the Wilcoxon Signed Rank Test obtained a value of ρ-value = 0.00 (<0.05), meaning that there is an influence on perineal wound healing before and after being given cinnamon boiled water as well as for the control group obtained ρ-value = 0.00 (<0.05), meaning that there is an influence on perineal wound healing before and after being given wound care.

Based on the results of the Mann-Whitney test, which is a non-parametric test used to determine the median difference between two independent groups if the dependent variable data scale is ordinal or interval/ratio but not normally distributed. The statistical results obtained an Asymp.sig (2- 2-tailed) value of 0.021. The results of this study showed that the average healing of maternal perineal wounds before being given cinnamon-boiled water was 0.07 and the average healing of maternal perineal wounds after being given cinnamon boiled water was 1.87, while the average healing of maternal perineal wounds before being provided wound care was 0.20. The average healing of maternal perineal wounds after being given wound care was 1.60, so that means there is a difference of 0.4 healing in the group providing cinnamon boiled water compared to the group given perineal wound care.

CONCLUSION

There is a difference in perineal wound healing of postpartum women before and after being given cinnamon boiled water. There is a difference in perineal wound healing of postpartum women before and after wound care is given. There is an effect of giving cinnamon boiled water on perineal wound healing in postpartum women.

https://doi.org/10.33086/jhs.v17.i01.4519

REFERENCES

Christiani, M. and Pane, H.W. (2023) 'Effect of kersen (muntingia calabura l) leaf decoction on perineal wound healing in postpartum women at Murniati Clinic Kisaran', *Science Midwifery*, 11(3), pp. 562–568.

D'Souza, J.C. (2020) 'An evaluation of the risk factors associated With sustaining perineal trauma At childbirth, subsequent birthing outcomes and the effects on pelvic floor dysfunction'. University of Southampton.

Darukshan, A. and Grover, A. (2022) 'Episiotomy Site Infection', in *Infections and Pregnancy*. Springer, pp. 535–546.

Girsang, B.M. and Elfira, E. (2023) 'A Literature Review on Postpartum Perineal Wound Care: Epidemiology, Impact, and Future Interventions', *Open Access Macedonian Journal of Medical Sciences*, 11(F), pp. 73–80.

Hajimonfarednejad, M. *et al.* (2019) 'Cinnamon: A systematic review of adverse events', *Clinical Nutrition*, 38(2), pp. 594–602.

Khan, M.S.A. and Ahmad, I. (2019) 'Herbal medicine: current trends and future prospects', in *New look to phytomedicine*. Elsevier, pp. 3–13.

Mukherjee, P.K. (2019) *Quality control and evaluation of herbal drugs: Evaluating natural products and traditional medicine*. Elsevier.

Rodrigues, M. *et al.* (2019) 'Wound healing: a cellular perspective', *Physiological reviews*, 99(1), pp. 665–706.

Saggar, S. *et al.* (2022) 'Traditional and herbal medicines: opportunities and challenges', *Pharmacognosy Research*, 14(2).

Slullitel, P.A. *et al.* (2020) 'Is there a role for preclosure dilute betadine irrigation in the prevention of postoperative infection following total joint arthroplasty?', *The Journal of Arthroplasty*, 35(5), pp. 1374–1378.

Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya
ISSN 1978-6743
E-ISSN 2477-3948

Blood Pressure, Stress Level, and Age with Sleep Quality in Elderly

Nety Mawarda Hatmanti[1], Yurike Septianingrum[2], Erika Martining Wardani[3], Rusdianingseh[4], Alimatus Sa'diyah[5]

[1,2,3,4] Lecturer at Bachelor of Nursing, Nursing and Midwifery Faculty, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia
[5] Student at Bachelor of Nursing, Nursing and Midwifery Faculty, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Blood pressure, Stress level, Age, Sleep quality

CORRESPONDENCE

E-mail: nety.mawarda@unusa.ac.id

A B S T R A C T

The ageing process in the elderly will cause several changes in the life cycle, one of which is in terms of sleep needs. Elderly sleep needs include sleep quality and quantity. The causes of both disorders are not only due to ageing factors but can also be caused by physical illness and psychological conditions of the elderly. Analyzing the relationship of blood pressure, stress level and age with sleep quality in the elderly. Using descriptive analytics with cross sectional methods. The population was 46 elderly, with simple random sampling technique obtained a sample of 42 elderly. Independent variables are blood pressure, stress level and age. The dependent variable is sleep quality. Blood pressure was associated with sleep quality (ρ =0.003), stress level was associated with sleep quality (ρ =0.008) and there was no association between age and sleep quality (ρ =0.936). The elderly need attention and support from people around them to carry out management in controlling blood pressure, stress levels and fulfillment of daily needs.

INTRODUCTION

The aging process experienced by the elderly is one of the etiologies of the event and can increase the severity of insomnia. The elderly experience changes in the structure, duration, depth, and continuity of sleep from previous conditions. The elderly experience shorter sleep times, lighter and frequent awakenings. Physiologically, the elderly enter sleep phases 1 and 2 and less into phases 3 and 4 sleep. Older people have less average sleep duration compared to young adults. (Akbar Harisa, Syahrul Syahrul, Yodang Yodang , Restu Abady, 2022)

Indonesia is one of the countries facing an increasing trend in the number of older adults. Badan Pusat Statistic released data on the number of elderly people based on the results of the 2016 Inter-Census Population Survey, estimating that the number of elderly people (aged 60 years and over) in Indonesia was 22,630,882 people. This figure is expected to increase to 31,320,066 by 2022. (Infodatin, 2022)

Sleep is an important anabolic process of cell and tissue regeneration and plays an important role in maintaining the dynamic balance between synapses and lymphatic metabolic clearance of the brain, thus contributing greatly to physical and mental health (Ji, Wang, Wang, & Liao, 2022). One of the common problems in aging is sleep disturbances that affect the quality of life of the elderly. Sleep is considered a basic human need and is included in one of Maslow's needs in terms of physiological needs in terms of allowing the human body to re-energize and relieve tension. Research shows that aging is associated with

https://doi.org/10.33086/jhs.v17.i01.4528

decreased sleep quality and quantity as age-related changes lead to lighter sleep and decreased sleep efficiency. The most common sleep complaints experienced by older people include difficulty falling asleep, waking up at night, waking up too early and being sleepy throughout the day. The number of hours of sleep will decrease with age. In older adults, the delta phase (deep sleep stage) is reduced in duration, as they only spend about 10% of this stage (Habibollahpour, Ranjkesh, Motalebi, & Mohammadi, 2019).

Several studies have shown that older people report poor sleep quality, with insomnia being the most common sleep disorder (Amicucci, Salfi, D'atri, Viselli, & Ferrara, 2021). The results showed that the level of depression had a significant effect on insomnia in the elderly. When the elderly experience a physical decline, the elderly will find it difficult to start sleeping and even insomnia occurs (Hatmanti & Muzdalifah, 2019). Another study also showed that there was a relationship between emotional stress levels and the quality of sleep of the elderly at the Cepiring elderly social service center, Kendal Regency. (Dahroni, Arisdiani, & Widiastuti, 2019).

METHOD

This research design uses a descriptive analytic design with a cross sectional approach. The population in this study were elderly people in RW.10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya, totaling 46 elderly people. Using probability sampling technique with simple random sampling technique, a sample of 42 elderly people was found. The inclusion criteria in this study were elderly people with compos mentis and healthy consciousness. Exclusion criteria in this study are elderly with dementia and decreased hearing. Data collection techniques for blood pressure variables use observation of blood pressure checks with a manual sphygmomanometer. The variable level of stress in the elderly was measured by the Perceived Stress Scale (PSS) questionnaire which consisted of 10 questions. Sleep quality variables were measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which consisted of 9 questions. Data analysis technique to know the relationship between variables using the SPSS Chi-Square test. Meanwhile, to find out which variables are most related, a binary logistic regression test is used.

RESULT

The results of the study are outlined in the table below:

https://doi.org/10.33086/jhs.v17.i01.4528

Table 1 Frequency distribution of respondents (n = 42)

Gender	f	%
Men	2	4,8
Women	40	95,2
Age		
45-59 year	0	0
60-74 year	33	78,6
75-90 year	9	21,4
>90 year	0	0
Blood pressure		
Normal	12	28,6
Prehypertension	9	21,4
Hypertension grade 1	14	33,3
Hypertension grade 2	7	16,7
Stress level		
Mild	9	21,4
Moderate	32	76,2
Heavy	1	2,4
Sleep quality		
Good	5	11,9
Poor	37	88,1

Table 1 shows that almost all elderly respondents (95.2%) are female. Almost all elderly respondents (78.6%) were in the age category 60-74 years. Almost half of the elderly respondents (33.3%) had grade 1 hypertension. Almost all elderly respondents (76.2%) had moderate stress levels. Almost all elderly respondents (88.1%) experienced poor sleep quality.

Table 2 Tabulation of the relationship between blood pressure and sleep quality

No	Category	Sleep quality		Amount	Statistic results
		Good	Poor		
1.	Normal	5 (11,9%)	7 (16,67%)	12 (28,57%)	ρ = 0,003
2.	Prehypertension	0 (0%)	9 (21,43%)	9 (21,43%)	
3.	Hypertension grade 1	0 (0%)	14 (33,33%)	14 (33,33%)	
4.	Hypertension grade 2	0 (0%)	7 (16,67%)	7 (16,67%)	
Amount		5 (11,9%)	37 (88,1%)	42 (100%)	

Table 2 shows that of 12 respondents who have normal blood pressure, most (58.3%) respondents have poor sleep quality. 9 respondents experienced prehypertension; all (100%) respondents experienced poor sleep quality. While 14 respondents experienced grade 1 hypertension, all (100%) experienced poor sleep quality and 7 respondents experienced grade 2 hypertension, all (100%) experienced poor sleep quality. Based on the results of statistical tests, there is a relationship between blood pressure and sleep quality in RW 10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya through the Chi-Square test with a significance level of $\alpha = 0.05$, the value $\rho = 0.003$ where ρ value < α, Ho is rejected, which means there is a relationship between blood pressure and sleep quality.

Table 3 Tabulation of the relationship between stress level and sleep quality

https://doi.org/10.33086/jhs.v17.i01.4528

No	Category	Sleep quality		Amount	Statistic results
		Good	Poor		
1.	Mild stress level	4 (9,52%)	5 (11,91%)	9 (21,43%)	ρ = 0,008
2.	Moderate stress level	1 (2,38%)	31 (73,81%)	32 (76,19%)	
3.	Heavy stress level	0 (0%)	1 (2,38%)	1 (2,38%)	
Amount		5 (11,9%)	37 (88,1%)	42 (100%)	

Based on table 3 shows that 9 respondents who have mild stress levels, most (55.6%) respondents have poor sleep quality while 32 respondents who have moderate stress levels, almost all (96.9%) respondents experience poor sleep quality and 1 respondent has a severe stress level, all (100%) experience poor sleep quality. Based on the results of statistical tests, there is a relationship between stress levels and sleep quality in RW 10 Demak Jaya, Tembok Dukuh Village, Bubutan Subdistrict Surabaya through the Chi Square test with a significance level of α = 0.05, the value ρ = 0.008 where ρ value < α, Ho is rejected, which means there is a relationship between stress levels and sleep quality.

Table 4 Tabulation of the relationship between age and sleep quality

No	Category	Sleep quality		Amount	Statistic Results
		Good	Poor		
1.	Middle age (45-59 years)	0 (0%)	0 (0%)	0 (0%)	ρ = 0,936
2.	Elderly (60-74 years)	4 (9,52%)	29 (69,05%)	33 (78,57%)	
3.	Old age (75-90 years)	1 (2,38%)	8 (19,05%)	9 (21,43%)	
4.	Very old age (>90 years)	0 (0%)	0 (0%)	0 (0%)	
Amount		5 (11,9%)	37 (88,1%)	42 (100%)	

Table 4 shows that 29 respondents aged elderly (60-74) years have poor sleep quality. Based on the statistical test results, the value of ρ = 0.936 is obtained, which means that age is not related to sleep quality.

DISCUSSION

From the statistical test results, age is not associated with sleep quality. The results of statistical tests contradict the results of previous studies which state that the quality of sleep of the elderly who are not good also experiences differences in each characteristic of the elderly. This is supported by research that most of the elderly aged 60-74 years' experience poor sleep quality and it is also found that the elderly aged 75-89 years' experience a decrease in sleep quality. From this research it can be concluded that age greatly affects the quality of sleep of the elderly (Jepisa & Riasmini, 2020). This difference is because most of the respondents' ages are still in the early stages of 60 years, so that indeed in terms of sleep

https://doi.org/10.33086/jhs.v17.i01.4528

quality they say that they can still sleep well. In the research data there were 9 elderly people aged in the range of 75-90 years, there were only most of the 8 elderly people who had poor sleep quality and only 1 elderly person who had good sleep quality and this was in line with previous research.

Elderly people who enter the age of 60-74 years at this age will experience a decrease in both physical and psychological factors and the increasing age the greater the risk of hypertension due to changes in blood vessel structure, namely narrowing of the lumen (Tyas & Zulfikar, 2021). Of the 33 elderly who are in this age category, 22 (66.67%) elderly people experience hypertension. This shows conformity with the theory of previous research. Based on gender, women are most affected by hypertension compared to men, this is in accordance with previous research that gender affects blood pressure (Nurhidayati, Aniswari, Sulistyowati, & Sutaryono, 2018). The results of the study also show that the quality of elderly sleep is significantly influenced by occupation, blood pressure, environment, age, gender, education, and marital status (Khalili, Z., Sadrollahi, A., Aseman, E., & Gholipour, 2017).

Based on the results of distributing PSS questionnaires, it was found that many elderly people had difficulty controlling anger. From this, it can be stated in question number 2, it is found that most elderly people say that they are often angry with their children and grandchildren if they ignore what is said. According to the researcher, this is due to the factor of increasing age, this is due to the heavier burden in life and more physiological functions that are increasingly experiencing a decline in various abilities such as visual ability, thinking, hearing, and remembering. In accordance with the opinion of Haryadi (2012) non-physical factors play a more significant role in influencing stress levels in the elderly such as nature, personality, perspective, and the level of education. Elderly people who always have a positive perspective will allegedly solve problems with a positive approach as well. Elderly people who always address problems positively, all the pressures of their lives will be considered small and can ultimately reduce stress.

CONCLUSION

The conclusion in this study is that blood pressure and stress levels are related to sleep quality, while age is not related to sleep quality.

REFERENCES

Akbar Harisa, Syahrul Syahrul, Yodang Yodang , Restu Abady, A. G. B. (2022). Analisis Faktor-Faktor yang Memengaruhi Kualitas Tidur Pasien Lanjut Usia dengan Penyakit Kronis. *Jurnal Kesehatan Vokasional*, *7*(1), 1–10.

Amicucci, G., Salfi, F., D'atri, A., Viselli, L., & Ferrara, M. (2021). The differential impact of COVID-19 lockdown on sleep quality, insomnia, depression, stress, and anxiety among late adolescents and elderly in Italy. *Brain Sciences*, *11*(10). https://doi.org/10.3390/brainsci11101336

Dahroni, D., Arisdiani, T., & Widiastuti, Y. P. (2019). Hubungan Antara Stres Emosi Dengan Kualitas Tidur Lansia. *Jurnal Keperawatan Jiwa*, *5*(2), 68. https://doi.org/10.26714/jkj.5.2.2017.68-71

Habibollahpour, M., Ranjkesh, F., Motalebi, S. A., & Mohammadi, F. (2019). The Impact of Benson's Relaxation Technique on the Quality of Sleep in the Elderly. *Topics in Geriatric Rehabilitation*, *35*(1), 88–94. https://doi.org/10.1097/TGR.0000000000000204

Hatmanti, N. M., & Muzdalifah, L. (2019). Hubungan Tingkat Depresi dengan Kejadian Insomnia pada Lanjut Usia di Griya Werdha Jambangan Surabaya. *Journal Health of Science*, *12*(1), 67–77. Retrieved from https://journal2.unusa.ac.id/index.php/JHS/article/view/832

Infodatin. (2022). *Lansia Berdaya, Bangsa Sejahtera*.

Jepisa, T., & Riasmini, N. M. (2020). *Karakteristik , Tingkat Depresi dan Faktor Lingkungan Fisik Dengan Characteristic , Depression Level , Physical Environment Factor with Sleep Quality of Geriatric Living at Pstw of Sumbar Provinces*. *4*(2), 152–159.

Ji, S., Wang, J., Wang, W., & Liao, F. (2022). Longer depressive duration reduces sleep duration more: A longitudinal study in the middle-aged and elderly Chinese. *Journal of Affective Disorders*, *317*(July), 185–192. https://doi.org/10.1016/j.jad.2022.08.051

Khalili, Z., Sadrollahi, A., Aseman, E., & Gholipour, F. (2017). Evaluation factors associated with sleep quality in the elderly shahid Beheshti hospital of Kashan. *Semantic Scholar*.

Nurhidayati, I., Aniswari, A. Y., Sulistyowati, A. D., & Sutaryono, S. (2018). Penderita Hipertensi Dewasa Lebih Patuh daripada Lansia dalam Minum Obat Penurun Tekanan Darah. *Jurnal Kesehatan Masyarakat Indonesia*, *13*, 4–8.

Tyas, S. A. C., & Zulfikar, M. (2021). HUBUNGAN TINGKAT STRESS DENGAN TINGKAT TEKANAN. *Jurnal Penelitian Keperawatan Kontemporer*, *1*(2), 75–82.

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Development of an Instrument for Measuring Intention to ACT and Healthy Eating Behavior of Students

Lia Junita Harahap[1], *Lena Juliana Harahap*[2]

[1]*Prodi Tadris Biologi, Fakultas Tarbiyah dan Ilmu Keguruan, UIN Syekh Ali Hasan Ahmad Addary Padangsidimpuan, Indonesia*
[2] *Prodi Kesehatan Masyarakat Program Sarjana, STIKes Darmais Padangsidimpuan, Indonesia*

ARTICLE INFORMATION

Received: May 16, 2023
Revised: August 21, 2023
Available online: February 2024

KEYWORDS

Instruments, Intention to Act, Healthy Eating Behavior

CORRESPONDENCE

E-mail: liajunitahrp@uinsyahada.ac.id

A B S T R A C T

The instrument is one of the supporting successes of learning. Assessment of student behavior will influence students' thoughts and decisions in taking more positive action. This study aims to develop a valid and reliable instrument for students' intention to act and Healthy Eating Behavior. The resulting instrument was a test in the form of a checklist. This research was conducted from March to April 2022 at SMA Negeri 1 Sayur Matinggi with a sample of 38 students from Natural Science 1 and Natural Science 2 classes. The research method uses the ADDIE model (Analyze, Design, Develop, Implement, Evaluate) adopted from the Branch. However, this research only reached the development stage. The results showed that the instrument for assessing the intention to act, and Healthy Eating Behavior was feasible with the respective expert validation results of 87.50 and 84.38. The results of the empirical validation show that 41 questions about the intention to act and 40 questions about healthy eating behavior were valid because they were more than 0.320, and the reliability was more than 0.6.

INTRODUCTION

Children in middle school age or teenagers are still physically and mentally developing. These changes or developments lead to various problems and changes in behavior, including changes in eating behavior that are good or bad eating behavior. Eating behavior is consuming food according to each individual's nutritional needs, which can be achieved by consuming nutrients in a balanced manner. Food choices and consumer behavior regarding food consumption are increasingly important (Vermeir et al., 2020).

Developing countries generally have problems consuming nutritious food, where 80% of people's energy comes from carbohydrates (Mokoginta et al., 2016). Simple and frugal food are the most popular types of food according to the range of sustainable consumer behaviors. In particular, Generation Z consumers mostly want sustainable, good eating behaviors (Fitzpatrick et al., 2020), while their environment does not support healthy buying behavior (Neill et al., 2023). This behavior continues to become a habit; much food and garbage are wasted. The concept of Healthy Eating Behavior goes beyond mere knowledge of nutritional recommendations.

The concept of Healthy Eating Behavior goes beyond mere knowledge of nutritional recommendations. Intention to Act in achieving Healthy Eating Behavior cannot be separated from the cultural mix of nutrition, health knowledge, and the environment (Dey et al., 2019; Perry et al., 2017). Intention becomes a motivating factor that influences certain behaviors. The stronger the intention, the more likely

https://doi.org/10.33086/jhs.v17.i01.4547

certain activities will be (Szymkowiak et al., 2022; Rasool et al., 2021; Aktas et al., 2018). Socio-demographic characteristics influence fruit consumption behavior (Kaliji et al., 2022). A country that has a tropical climate with abundant biodiversity makes people living in these locations accustomed to consuming fruits and vegetables. The lifestyle was also identified as an essential factor (Miguel et al., 2022; Lena Juliana Harahap & Harahap, 2022).

An unhealthy lifestyle and eating behaviors can improve or harm long-term health. Evidence shows that eating fruits and vegetables can protect against many chronic diseases, such as cardiovascular disease and diabetes, while consuming too much-saturated fat, sugar, and salt can exacerbate health problems. Eating behavior, which includes the selection of children's and adolescents' food types, is primarily influenced by descriptive norms (Hamzah et al., 2021; Sharps & Robinson, 2016); good food positively influences eating behavior (Wijayaratne et al., 2018; Szymkowiak et al., 2022).

Developing students' Intention to Act and Healthy Eating Behavior can be improved by assessing students. One way to increase student awareness in behaving or consuming healthy food is by holding a more emphasized assessment (Amicarelli & Bux, 2021). Therefore, assessment is critical to cultivate the importance of consuming healthy food daily, which can help the body stay fit and avoid various diseases. A healthy body will have an impact on student achievement.

Assessment will also be good if the instrument is used (Lia Junita Harahap et al., 2020). The quality of the assessment instrument will directly affect the results' accuracy. Therefore, instruments that can awaken, develop, and familiarize students to Act and behave in healthy eating are urgently needed and are equipped with appropriate assessment rubrics so that students are accustomed to thinking about the attitudes and food they consume, whether they are right or not for their health. The four conditions for a good instrument include being valid (valid), reliable (can be trusted), practical (can be used), and economical (not wasteful). A good instrument has several preparation steps: 1. Referring to the syllabus, 2. They are compiling a question grid, three and compiling questions, 4. Carrying out test trials, 5. They are making scoring guidelines (Kadir, 2015).

The results of interviews with teachers regarding healthy food at SMAN 1 Sayur Matinggi showed that the teacher monitored the types of food or snacks sold in the school canteen but occasionally missed the teacher's monitoring. Students also often bring snacks from outside the school into the school.

Environment. Before the assessment, the questions were validated to determine whether they were suitable for assessing students' intention to act and healthy eating behavior. The test will be considered eligible if the validity and reliability requirements are met (Baldinger & Lai, 2019). Therefore, a valid and reliable assessment instrument needs to be developed. The acting and Healthy Eating Behavior instrument in this study refers to the ADDIE development model (Analyze, Design, Develop, Implement, Evaluate). This research and development aim to produce a valid and reliable instrument for students' Intention to Act and

Healthy Eating Behavior so that it can be used as an alternative in measuring, training, and increasing students' Intention to Act and behave in healthy eating.

METHOD

The method used in making the Intention to Act and Healthy Eating Behavior test product for class XI students is research and development (R&D). This study adapted the ADDIE development model from Branch. The ADDIE model has five implementation stages, namely:

However, this research only reached the development stage. The population in this study were all class XI students of SMA Negeri 1 Sayur Matinggi, with a sample of 38 students for the 2021/2022 academic year. The following describes each stage.

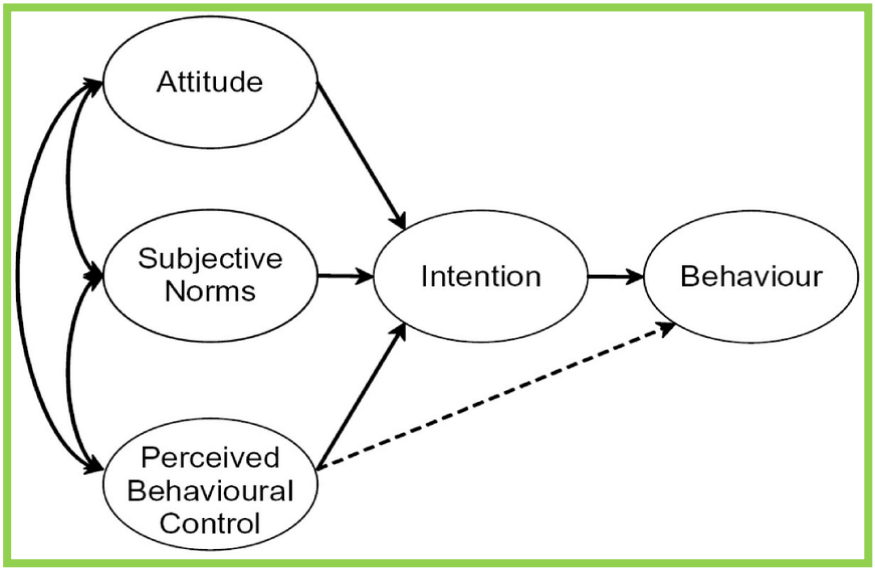


Figure 1. The Theory of Intention to Act

A. Analyze Phase

This stage aims to determine and define learning requirements, which consist of the following steps: (a) initial and final analysis, (b) student analysis, (c) task analysis, and (d) material concept analysis.

B. Design Stage

This stage is the initial planning or design stage, such as making an outline, determining the indicators to be measured (Tables 1 and 2), and developing the Intention to Act instrument from Ajzen (1991) and

https://doi.org/10.33086/jhs.v17.i01.4547

Healthy Eating Behavior in the form of a checklist, complete with an assessment rubric. Ajwen's theoretical model is illustrated in Figure 1.

The factors in the theoretical model in Figure 1 act as determinants of behavioral intentions, influencing the individual's actual behavior. Attitude is a person's feelings of pleasure or displeasure towards behavior. Subjective norms are individual estimates of social pressure to perform or not perform the target behavior.

Table 1. Indicators of Intention to Act

Variable	Indicator	Description Problem
Intention to Act	Attitude Toward the Behavior	The desire to eat food with balanced nutrition Desire to grow vegetables and fruit The desire for a variety of healthy foods
	Subjective Norm	The desire to uphold the rules for consuming food and beverages in Indonesia. The desire does not violate the rules for consuming halal food and drinks.
	Perceived Behavior Control	Desire not to overeat, not eat food or drink with preservatives, and reduce consumption of fried foods. Desire to prefer the consumption of plant-based nutrition The desire to share knowledge about healthy eating substances with family, friends, and the community

Table 2. Healthy Eating Behavior Indicators

Variable	Indicator
Healthy Eating Behavior	Time and Number of Food Food Hygiene Selection of Food and Beverage Types

C. Develop stage

This stage consists of instrument assessment by the validator and empirical validation of students. Here's the development sequence.

1. Expert judgment

   Experts (validators) in developing this instrument are Masters of Nutrition and Master of Public Health, experts in Intention to Act, Healthy Eating Behavior, and nutrition.

2. Instrument Development Test

Instruments that have been validated by experts (construct and content validation) are then tested on students. The test results determine the empirical validity and reliability of the Intention to ACT and Healthy Eating Behavior.

RESULT AND DISCUSSION

The results of this study were in the form of an Intention to Act questionnaire instrument and a Healthy Eating Behavior questionnaire for students. The following are the results of instrument development for each phase.

https://doi.org/10.33086/jhs.v17.i01.4547

1. Analyze

This analysis was carried out on teachers who teach in class XI of science in unstructured interviews regarding learning activities, eating, and snacks for students at school. Based on the interviews, the teacher said that no one was selling outside the school gates because the school was far from residential areas, and no other buildings were around. So, students only snack in the school canteen. In addition, students also bring food and snacks from home.

Based on interviews conducted with teachers, the Intention to Act and Healthy Eating Behavior of students still need to improve. This can be seen from the preliminary test results achieved in the low category. The results can be seen in Table 3 and Table 4. The questionnaire about students' intention to act and healthy eating behavior consisted of 50 statements: 25 statements to measure the intention to work and 25 statements to measure students' healthy eating behavior. Expert lecturers have validated these questions and are indicators of students' Intention to Act and Healthy Eating Behavior.

Table 3. Average student answers from the Intention to Act indicator

Variable	Indicator	Average	Total Rate	Percentage	
				P	NP
Intention to Act	Attitude Toward the Behavior	72.82	73.57	31%	69%
	Subjective Norm	81.23			
	Perceived Behavior Control	66.67			

Inf: P (Pass), NP (Not Pass)

Table 4. Average student answers for indicators of healthy eating behavior

Variable	Indicator	Average	Total Rate	Percentage	
				P	NP
Healthy Eating Behavior	Time and Number of Food	62.41	58.80	12%	88%
	Food Hygiene	60.86			
	Selection of Food and Beverage Types	53.12			

Inf: P (Pass), NP (Not Pass)

Based on Table 3 and Table 4, the average results of students' Intention to Act were 73.57, and students' Healthy Eating Behavior was 58.80. It is still in the low category. For the Intention to Act, only 31% are good, while for Healthy Eating Behavior, it is as much as 12%. The achievement results on the Intention to Act indicator are higher than those on Healthy Eating Behavior. This is because students are more concerned with health, namely by consuming healthy food rather than direct action; students still need help starting the habit of consuming healthy food. Moreover, there is much unhealthy food around students, created from the family, play, and school environments.

a. Task Analysis

Based on the initial and final analysis and student analysis, efforts are needed to increase students' Intention to Act and Healthy Eating Behavior. One is by providing an assessment instrument that includes all healthy eating habits.

https://doi.org/10.33086/jhs.v17.i01.4547

b. Content Concept Analysis

The results of the analysis were obtained from healthy food standards according to WHO, which are summarized in 3 ways, namely (1) increasing consumption of vegetables, fruit, whole grains, nuts, and whole grain cereals, (2) reducing consumption of salt, sugar, rice, and all that is white, or which have undergone a refining process, (3) must avoid trans fats.

2. Design

a. The stage of making an outline and determining indicators

Designing the Intention to Act and Healthy Eating Behavior instruments differ because they have different indicators. The following is presented in Table 5 and Table 6.

Table 5. Instrument design and determination of the Intention to Act as indicators

NO	QUESTION	A	O	ST	S	N
Subjective Norm						
1	I want to consume expired free food because it is delicious and expensive.					
2	Etc					

Inf: A=Always, O=Often, ST=Sometimes, S=Seldom, atau N=Never

Table 6. Instrument design and determination of Healthy Eating Behavior

NO	QUESTION	A	O	ST	S	N
Selection of Food and Beverage Types						
1	I prefer to consume bananas rather than fried bananas.					
2	Etc					

Inf: A=Always, O=Often, ST= Sometimes, S=Seldom, atau N=Never

The outlines in Tables 5 and 6 consist of indicators or aspects measured in the Intention to Act, Healthy Eating Behavior, questions, and answer keys.

b. Development of Intention to Act instruments and Healthy Eating Behavior

The intention to act instrument that has been developed consists of 41 positive and negative questions in multiple choice. Meanwhile, the Healthy Eating Behavior instrument comprised 39 positive and multiple-choice negative questions.

An example of measuring the Intention to Act

I limit my consumption of sweets, soft drinks, and foods with added sugar

A = Always

O = Often

ST = Sometimes

S = Seldom

N = Never

The answer that gets the highest points is “A=Always” because by limiting sweet foods, soft drinks, and foods with added sugar, you can prevent diseases such as diabetes, stroke, and muscle and kidney disorders.

https://doi.org/10.33086/jhs.v17.i01.4547

Examples of questions measuring Healthy Eating Behavior

I don't want to buy or eat fried food that vehicle fumes have hit on the side of the road.

The answer that gets the highest points is “A=Always” because you can avoid various diseases, such as increased bad cholesterol, by not consuming fried foods sold on the side of the road. Fried food sold on the side of the road is also susceptible to microbes and the heavy metal Lead (Pb).

Table 7. Instrument design and determination of the Healthy Eating Behavior as indicators

No	Indicator	Question	Answer
1	Subjective Norm	I want to consume expired free food because it is delicious and expensive	A = Always = 1 O = Often = 2 ST = Sometimes = 3 S = Seldom = 4 N = Never = 5

Table 8. Instrument design and determination of Healthy Eating Behavior

No	Indicator	Question	Answer
1	Selection of Food and Beverage Types	I prefer to consume bananas rather than fried bananas	A = Always = 1 O = Often = 2 ST = Sometimes = 3 S = Seldom = 4 N = Never = 5

3. Develop

a. Expert Score

The validators in this study were two lecturers from the Master of Public Health and Master of Nutrition who are experts in the Intention to Act for Healthy Eating and Healthy Eating Behavior. The validation process refers to indicators of will act, Healthy Eating Behavior, and healthy food standards.

In the validation process, validator I and validator II provided comments and suggestions about the accuracy of the statement, presentation of the statement, the concept of healthy food, the appropriateness of the indicators of Intention to Act, and Healthy Eating Behavior towards the statement. Instrument development that has been carried out will be assessed by the validator in the form of a number, namely, 1 to 100. The aspects evaluated consist of the assessment technique's suitability, the instrument's completeness, content suitability, the construction of the questions, and the language. Then, the average will be sought to determine the instrument's feasibility, as shown in Table 8.

Table 9. Expert validator scores for the Intention to Act and Healthy Eating Behavior

Component	Question type	Expert	Percentage of appropriateness	Total Rate	Conclusions
Intention to Act	Checklist	Expert I Expert II	84.38 90.63	87.50	Very Appropriate
Healthy Eating Behavior	Checklist	Expert I Expert II	81.25 87.50	84.38	Very Appropriate

https://doi.org/10.33086/jhs.v17.i01.4547

Table 8 shows that the developed instrument is appropriate or feasible to measure students' Intention to Act and Healthy Eating Behavior because it achieves an average of 81.03 and 85.00. Therefore, further empirical validation can be carried out.

b. Results of Empirical Validation and Reliability

The results of calculating the validity of the Intention to Act and Healthy Eating Behavior of 38 students using the Pearson product-moment are in Table 9 and Table 10.

Table 10. The results of the validation of students' Intention to Act

Question Validity Criteria	Question Number	Amount
Valid	1, 2, 3, 4, 6, 7, 8, 10, 11, 13, 14, 15, 16, 19, 20, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 53, 54	41
Invalid	5, 9, 12, 17, 18, 21, 22, 23, 24, 27, 50, 51, 52, 55	14

Based on Table 7, the validity of the items on the Intention to Act that meet valid criteria or exceed the minimum value is 41 questions because the table is 0.320. The result of instrument reliability is 0.987, which meets the requirements of a very reliable question. Interpretation of reliability can be determined if it has r11 ≥ 0.6 (Suharsimi, 2013). This shows that the instrument that has been developed has very high reliability. The validity of Healthy Eating Behavior questions can be found in Table 10.

Table 11. Results of the calculation of the validity of the test items

Question Validity Criteria	Question Number	Amount
Valid	2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 45, 47, 48	39
Invalid	1, 9, 12, 23, 24, 27, 34, 44, 46	9

Based on Table 5, the r table of 0.320 yields 39 valid Healthy Eating Behavior items. The result of instrument reliability is 0.986. This shows that the instrument has very high reliability, which means the constancy of the instrument when applied wherever and whenever, will relatively give the same results. Several instruments of Intention to Act and Healthy Eating Behavior that are valid and reliable are in Appendix 1 and Appendix 2.

CONCLUSION

Based on the research results, it can be concluded that the instrument of Intention to Act and Healthy Eating Behavior in the form of a checklist that has been developed is appropriate to be used to measure students' Intention to Act and Healthy Eating Behavior. The developed instrument is expected to assist teachers in directing students to care more about health by paying attention to the positive and negative impacts of the food consumed, starting from small steps and breakthroughs so that they become accustomed to it.

https://doi.org/10.33086/jhs.v17.i01.4547

REFERENCES

Aktas, E., Sahin, H., Tapaloglu, Z., Oledinma, A., Huda, A. K. S., Irani, Z., & Sharif, A. M. (2018). A consumer behavioral approach to food waste. *Journal of Enterprise Information Management*, *31*(5), 658–673. https://doi.org/10.1108/JEIM-03-2018-0051

Amicarelli, V., & Bux, C. (2021). Food waste measurement toward a fair, healthy and environmental-friendly food system : a critical review. *British Food Journal*, *123*(8), 2907–2935. https://doi.org/10.1108/BFJ-07-2020-0658

Arikunto, S. (2013). *Manajemen Penelitian*. PT Rineka Cipta.

Baldinger, E. E., & Lai, Y. (2019). Pedagogical context and proof validation: The role of positioning as a teacher or student. *Journal of Mathematical Behavior*, *55*, 100698. https://doi.org/10.1016/j.jmathb.2019.03.005

Dey, B. L., Alwi, S., Yamoah, F., Agyepong, S. A., Kizgin, H., & Sarma, M. (2019). Towards a framework for understanding ethnic consumers ' acculturation strategies in a multicultural environment. *International Marketing Review*, *36*(5), 771–804. https://doi.org/10.1108/IMR-03-2018-0103

Fitzpatrick, K. M., Harris, C., Drawve, G., & Willis, D. E. (2020). Assessing Food Insecurity among US Adults during the COVID-19 Pandemic. *Journal of Hunger & Environmental Nutrition*, 1–18. https://doi.org/10.1080/19320248.2020.1830221

Hamzah, H., Sutan, R., Tamil, A. M., Bee, A., Kassim, M., & Soid, A. M. (2021). Assessment of healthcare workers' behavior in implementing a newborn screening program for congenital hypothyroidism in Perak, Malaysia. *Journal of Health Research*, *35*(2), 1–14. https://doi.org/10.1108/JHR-08-2019-0198

Harahap, Lena Juliana, & Harahap, L. J. (2022). Hubungan Pengetahuan Kesehatan Reproduksi dengan Perilaku Seksual Remaja di SMA Negeri 8 Padangsidimpuan. *Bioedunis Journal*, *01*(2), 67–72.

Harahap, Lia Junita, Ristanto, R. H., & Komala, R. (2020). Evoking 21st-Century Skills: Developing Instrument of Critical Thinking Skills and Mastery of Ecosystem Concepts. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *5*(1), 27–41. https://doi.org/10.24042/tadris.v5i1.5943

Kadir, A. (2015). Menyusun dan menganalisis tes hasil belajar. *Al-Ta'dib*, *8*(2), 70–81.

Kaliji, S. A., Imami, D., Canavari, M., Gjonbalaj, M., & Gjokaj, E. (2022). Fruit-related lifestyles as a segmentation tool for fruit consumers. *British Food Journal*, *124*(13), 126–142. https://doi.org/10.1108/BFJ-09-2021-1001

Miguel, L., Marques, S., & Duarte, A. P. (2022). The influence of consumer ethnocentrism on purchase of domestic fruits and vegetables : application of the extended theory of planned behavior. *British Food Journal*, *124*(13), 599–618. https://doi.org/10.1108/BFJ-11-2021-1208

Mokoginta, F. S., Budiarso, F., & Manampiring, A. E. (2016). Gambaran pola asupan makanan pada remaja di kabupaten bolaang mongondow utara. *Jurnal E-Biomedik (EBm)*, *4*(2), 1–10.

Neill, C. O., McCarthy, M. B., Reilly, S. O., & Alfnes, F. (2023). Food interests, preferences, and behaviours : a profile of the sustainable food consumer. *British Food Journal*, *125*(13), 352–374. https://doi.org/10.1108/BFJ-09-2022-0762

Perry, E. A., Thomas, H., Samra, H. R., Edmonstone, S., Davidson, L., Faulkner, A., Petermann, L., Manafò, E., & Kirkpatrick, S. I. (2017). Identifying attributes of food literacy : a scoping review. *Public Health Nutrition*, *20*(13), 2406–2415. https://doi.org/10.1017/S1368980017001276

Rasool, S., Cerchione, R., Ferraris, A., Management, D., & Abbate, S. (2021). Measurement of consumer

awareness of food waste : construct development with a confirmatory factor analysis. *British Food Journal*, *123*(13), 337–361. https://doi.org/10.1108/BFJ-02-2021-0160

Sharps, M., & Robinson, E. (2016). Encouraging children to eat more fruit and vegetables : Health vs . descriptive social norm-based messages. *Appetite*, *100*, 18–25. https://doi.org/10.1016/j.appet.2016.01.031

Szymkowiak, A., Antoniak, M. A., & Borusiak, B. (2022). The role of health orientation in determining purchase intention and behaviour. *British Food Journal*, *124*(13), 559–577. https://doi.org/10.1108/BFJ-12-2021-1272

Vermeir, I., Weijters, B., Houwer, J. De, Geuens, M., Slabbinck, H., Spruyt, A., Kerckhove, A. Van, Lippevelde, W. Van, & Steur, H. De. (2020). Environmentally Sustainable Food Consumption : A Review and Research Agenda From a Goal-Directed Perspective. *Journal Frontiers in Psychology*, *11*, 1–24. https://doi.org/10.3389/fpsyg.2020.01603

Wijayaratne, S. P., Reid, M., Westberg, K., Worsley, A., Mavondo, F., Wijayaratne, S. P., Reid, M., Westberg, K., Worsley, A., Mavondo, F., Reid, M., Westberg, K., Worsley, A., & Mavondo, F. (2018). Food literacy, healthy eating barriers, and household diet barriers. *European Journal of Marketing*, 1–30. https://doi.org/10.1108/EJM-10-2017-0760

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

The Effect of Fermentation Time and Mass Variation of Saccharomyces Cerevisiae on The Characteristics of Virgin Coconut Oil from The Coconut Milk Fermentation Process

Anisa Tri Hutami[1], *Evawanti A. Warsito*[2]

[1,2] *Department of Nutrition, Poltekkes Kemenkes Sorong, Indonesia*

ARTICLE INFORMATION

Received: September 6, 2023
Revised: January 12, 2024
Available online: February 2024

KEYWORDS

Virgin coconut oil, fermentation, Saccharomyces cerevisiae

CORRESPONDENCE

E-mail: anisa.trihutami@gmail.com

A B S T R A C T

Virgin coconut oil is one of the processed coconut products that has many benefits. Virgin coconut oil can be produced through extraction, centrifugation, and fermentation processes. In this study, virgin coconut oil was made by fermentation using baker's yeast (Saccharomyces cerevisiae). This study aims to determine the effect of fermentation time and mass variation of Saccharomyces cerevisiae used on the characteristics of virgin coconut oil produced. The process of making virgin coconut oil in this study is to separate skimmed water from coconut milk. Skimmed steering is mixed with Saccharomyces cerevisiae with variations of 0, 1, 1.5, and 2 grams, with fermentation durations of 12, 18 and 24 hours. The resulting virgin coconut oil is then analyzed to determine the iodine, peroxide, and acid numbers. From the results of the study, it is known that there is no relationship between the duration of fermentation and the mass of yeast Saccharomyces cerevisiae in the manufacture of virgin coconut oil from coconut milk against iodine number. The peroxide number for all variables of fermentation duration and yeast mass is 2 meq/kg. The acid number tends to increase with the length of fermentation, with the highest value being 0.6% at 24 hours fermentation time and the yeast mass of Saccharomyces cerevisiae 1.5 grams.

INTRODUCTION

Coconut (*Cocos nucifera L.*) is a plant that can be used by humans, from the tops of the leaves to the roots. Coconut belongs to the palm tribe (aracaceae), is a plant that has many benefits, which thrives in tropical regions such as in Indonesia. Coconut palms grow up to 30 meters, producing 75 fruits per year with favorable environmental conditions (da Silva Lima &; Block, 2019).

In the city of Sorong, Southwest Papua Province, coconuts thrive along coastlines as well as plantations. Coconut production in West Papua Province in 2019 was 16,169 yon, an increase of 2.62% compared to 2018. So that diversification of coconut products is needed to increase the usefulness of coconuts in the community.

At the beginning of 2022, Indonesia experienced a scarcity of palm oil products, which are the people's main choice in processing fried foods. This causes people to start looking for other alternatives in the use of goring oil, one of which is by using coconut oil. Coconut oil can be made on a household scale by cooking coconut milk into coconut oil and Blondo. However, this process requires a long time and a lot of fuel (Karouw & Santosa, 2013).

Besides being able to be obtained into cooking oil, old coconut milk can be processed into *Virgin Coconut Oil* (VCO) which does not require high temperatures in the manufacturing process, otherwise known as *the wet coconut process*. Unlike in the manufacture of coconut oil, VCO maintains the distinctive aroma of

https://doi.org/10.33086/jhs.v17.i01.5085

coconut to produce more fragrant dishes. VCO contains higher saturated fatty acids than palm oil, so it tends to be more stable in structure (Mujdalipah, 2016).

VCO is also considered healthier, with antioxidant content, acts as a probiotic, and can play a role in weight loss. In addition, VCO can also be used in skin and hair care. The process of making VCO can be done in several ways, namely: enzymatic, microbial fermentation, acidification, centrifugation and fishing methods (Mujdalipah, 2016).

Virgin coconut oil is extracted from fresh coconut flesh or dried coconut meat. The oil content in copra is generally 60-65%, while the oil content in fresh coconut flesh is around 43% (Andaka &; Sentani, 2016). The centrifugation method is a mechanical method, which is done by breaking the fat-protein bonds in coconut milk by rotating at high speed. After centrifugation, water and oil will separate by themselves due to differences in the specific gravity of water and oil (Sherliana et al., 2021).

In this study, a fermentation process was used for making VCO by using baker's yeast (*Saccharomyces cerevisiae*) as a starter in the fermentation process of old coconut milk to become VCO. Baker's yeast is used because in the form of emulsions it can produce enzymes that play a role in converting glucose into alcohol. The resulting alcohol plays a role in breaking down the coconut milk emulsion to produce oil (Khazalina, 2020).

The advantages of fermentation demoted are energy saving, easy to take the oil produced and the quality of the oil produced can be maintained by adjusting the ratio of raw materials with *Saccharomyces cerevisiae* used (Erika et al., 2014).

METHOD

The necessary ingredients are aged coconut meat, water, baker's yeast (*Saccharomyces cerevisiae*), chloroform, Wijs solution, Potassium Iodide, NaOH, Sodium Thiosulfate, amylum indicator, phenolphthalein indicator, 95% ethanol. Old coconut meat obtained at the market in Sorong City is shredded and squeezed by adding enough water to produce coconut milk. Coconut milk is then allowed to stand for 2 hours to get coconut milk cream. The coconut milk cream is then separated from the water. Baker's yeast starter as much as 1 gram, 1.5 grams, 2 grams added to 100 grams of coconut milk cream. After that, the fermentation process is carried out anaerobically for 12 hours, 18 hours and 24 hours.

IOD Number Test

The iodine number was measured by weighing 5 grams of coconut oil sample and then put into a lided Erlenmeyer. Then added 10 ml chloroform and 25 ml of Wijs reagent, then stored in a dark room for 30 minutes and occasionally shaken. Then added 10 ml of 15% KI solution, 50 ml of water and 2 ml of

https://doi.org/10.33086/jhs.v17.i01.5085

amylum solution. Then continue by titrating with 0.05 N sodium thiosulfate until the blue color disappears (Sinurat &; Silaban, 2021)

The iodine number is expressed as grams of iodine absorbed per 100 g using the formula:

$$Bilangan\ iod = \frac{12{,}69\ \times T\ (V_3 - V_4)}{m}$$

Information:

T = Normality of standard solutions of sodium thiosulfate

V_3 = Volume of sodium thiosulfate solution required for blank titration (ml)

V_4 = Volume of natrium thiosulfate solution required for sample titration

m = sample weight (grams)

Peroxide Number Test

The peroxide number was measured by weighing 0.3 - 5.0 grams of oil samples into a 300 ml Erlenmeyer, adding 30 ml of a solution mixture of 20 ml of glacial acetic acid, 25 ml of 95% ethanol and 55 ml of chloroform. Add I gr KI and keep in a dark place for 50 ml, then add water, titrate with a standard solution of 0.02 N sodium thiosulfate with starch solution as an indicator. Determine blanks and calculate the peroxide number in the sample (*Indonesian National Standard: How to Test Oil and Fat*, 1998).

The peroxide number is expressed in milligrams equivalent of active oxygen per kg, using the formula:

$$Bilangan\ peroksida\ \left(\frac{mgrek}{kg}\right) = \frac{(V_0\ -\ V_1\ ) \times T}{m} \times 1000$$

Information:

V_0 = Volume of sodium thiosulfate solution for blanks, in ml

V_1 = Volume (ml) of sodium thiosulfate solution for sample

T = Normality of standard solutions of sodium thiosulfate used

M = Sample weight in grams

Acid Number Test

Weigh 2-5 grams of oil sample into Erlenmeyer 250 ml, then add 50 ml of 95% neutral ethanol. Add 3 – 5 indicators of Phenolphthalein and titrate with a standard solution of 0.1 N NaOH until the pink color remains (unchanged for 15 seconds) (*Indonesian National Standard: How to Test Oil and Fat*, 1998).

The acid number is expressed as mg KOH / gram of fat using the formula:

https://doi.org/10.33086/jhs.v17.i01.5085

$$Kadar\ asam\ lemak\ bebas = \frac{M \times V \times T}{10\ m}$$

Information:

V = volume of NaOH required in titration (ml)

T = normality NaOH

m = Example weight, in grams

M = Molecular weight of fatty acids

In coconut oil testing, the acid number is calculated as lauric acid, which has a molecular weight of 200.

RESULT AND DISCUSSION

The result of the physical appearance of virgin coconut oil is that it has a distinctive coconut smell, not rancid, a distinctive taste of coconut oil and is clear in color. The physical appearance of virgin coconut oil produced in accordance with the Indonesian National Standard (SNI), is similar in terms of smell, taste, and color.

Effect of Fermentation Duration and Yeast Mass of Saccharomyces cerevisiae on Iodine Number

The iodine number can indicate the degree of unsaturation of the constituent fatty acids of the fat. Based on linear regression analysis, it showed that the entire treatment, both the addition of yeast and the duration of fermentation, had no noticeable effect ($p > 0.05$). Based on table 1, the average iodine number resulting from the influence of fermentation duration and yeast addition is 4.16 – 4.57, where this value is in accordance with the standard set by SNI for iodine number in virgin coconut oil, which is 4.10 – 11.0 mgrek / kg.

Table 1. Effect of Fermentation Duration and Yeast Mass of *Saccharomyces cerevisiae* on Iodine Number

Fermentation Time	Yeast of *Saccharomyces cerevisiae* mass			
	0 gr	1 gr	1,5 gr	2 gr
12 Hours	4,31	4,48	4,40	4,19
18 Hours	4,42	4,37	4,57	4,26
24 Hours	4,16	4,29	4,29	4,25

A low iodine number indicates that the oil does not contain many unsaturated fatty acids. Unsaturated fatty acids can bind iodine and form saturated compounds or unsaturated bonds contained in oil. The number of iodine tied indicates the number of double bonds (Widjaja &; Anjarsari, 2014).

Effect of Fermentation Time and Yeast Mass of Saccharomyces cerevisiae on Peroxide Number

Peroxide number is the amount of peroxide present in the sample, expressed in terms of milliequivalent active oxygen per kg, which oxidizes potassium iodide under treatment conditions such as in peroxide number testing (SNI). It is associated with rancidity in the oil, as it is associated with a decrease in quality and shelf life. oil (C.C. Kusuma et al., 2022).

https://doi.org/10.33086/jhs.v17.i01.5085

Table 2. Effect of Fermentation Time and Yeast Mass of *Saccharomyces cerevisiae* on Peroxide Number

Fermentation Time	Yeast of *Saccharomyces cerevisiae* mass			
	0 gr	1 gr	1,5 gr	2 gr
12 Hours	2	2	2	2
18 Hours	2	2	2	2
24 Hours	2	2	2	2

In this study, it was found that in all variables, both the length of fermentation time and the mass of yeast Saccharomyces cerevisiae used, produced the same peroxide number, which is 2 meq / kg. The value of this peroxide number is still in accordance with the SNI standard for virgin coconut oil, which is 2 meq / kg. Meanwhile, the results of Patty's research (2015) show that the longer the fermentation time in traditional coconut oil products, the peroxide number will increase. This is because the longer the fermentation time, the unsaturated fatty acids contained in coconut oil will be greater and make the oil in direct contact with oxygen, thus the reaction of free radical formation which is then converted into hydroperoxide will increase (Patty, 2015). Oil oxidation reactions begin with the formation of free radicals caused by factors that can speed up reactions such as light, thermal energy, metal catalysts and enzymes. Free radicals with oxygen will form active peroxides that can form hydroperoxides that are very unstable.

Effect of Fermentation Time and Yeast Mass of Saccharomyces cerevisiae on Acid Number

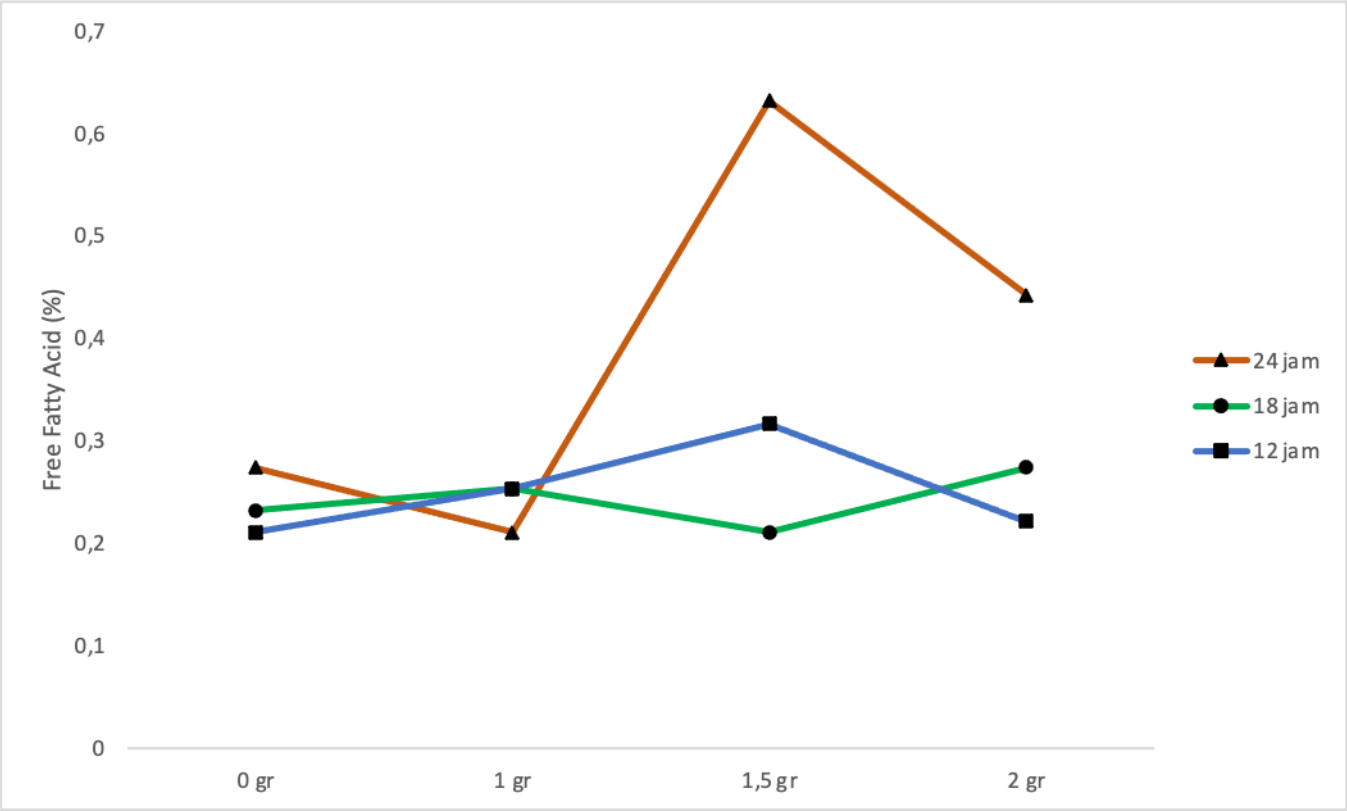


Figure 1. The acid number of virgin coconut oil

https://doi.org/10.33086/jhs.v17.i01.5085

The results of the number of free fatty acids obtained ranged from 0.2 – 0.6%, where the number of free fatty acids at 24 hours fermentation time with the addition of *Saccharomyces cerevisiae* yeast as much as 1.5 gr higher than the time and the addition of other yeasts.

Free fatty acids can be benthic since the oil is still in plant tissues, due to the presence of lipase enzymes that can hydrolyze neutral fats (triglycerides). But in living organisms, enzymes are generally in an inactive state or state because there are still interactions between cells. In organisms that have died, the mechanism of the cells gets damaged so that the lipase enzyme starts working and damages the fat molecules. The speed of hydrolysis of lipase enzymes present in tissues is relatively slower at low temperatures and will be more intensive under suitable conditions. Coconuts that have been shredded, the cell structure has been damaged so that the lipase enzyme begins to work to damage fat molecules (Pontoh, 2008). The longer the fermentation time, the higher the free fatty acids contained in the oil (Sherliana et al., 2021). Free fatty acids are one of the parameters of oil damage due to the hydrolysis process with interaction with water and lipase enzyme activity, so the lower the free fatty acids, the better the quality of the oil produced. The maximum requirement for the number of free fatty acids for virgin coconut oil according to SNI is 0.2%.

CONCLUSION

There is no relationship between the duration of fermentation and the mass of the yeast *Saccharomyces cerevisiae* in the preparation of virgin coconut oil from coconut milk to iodine number. The peroxide number for all variables of fermentation duration and yeast mass is 2 meq/kg. The acid number tends to increase with the length of fermentation, with the highest value being 0.6% at 24 hours of fermentation time and the yeast mass of *Saccharomyces cerevisiae* 1.5 grams.

REFERENCES

Andaka, G., & Sentani, A. (2016). Pengambilan Minyak Kelapa Dengan Metode Fermentasi Menggunakan Ragi Roti. *Jurnal Teknik Kimia*, *10*(2), 65–70.

C.C. Kusuma, Y., Mayun Permana, I. D. G., & Timur Ina, P. (2022). Pengaruh Jenis Ragi dan Lama Fermentasi terhadap Karakteristik Virgin Coconut Oil (VCO). *Jurnal Ilmu Dan Teknologi Pangan (ITEPA)*, *11*(1), 74. https://doi.org/10.24843/itepa.2022.v11.i01.p08

da Silva Lima, R., & Block, J. M. (2019). Coconut oil: What do we really know about it so far? *Food Quality and Safety*, *3*(2), 61–72. https://doi.org/10.1093/fqsafe/fyz004

Erika, C., Yunita, Y., & Arpi, N. (2014). Pemanfaatan Ragi Tapai dan Getah Buah Pepaya pada Ekstraksi Minyak Kelapa secara Fermentasi. *Jurnal Teknologi Dan Industri Pertanian Indonesia*, *6*(1), 1–6. https://doi.org/10.17969/jtipi.v6i1.1982

Karouw, S., & Santosa, B. (2013). Minyak kelapa sebagai sumber asam lemak rantai medium. Pros Konf Nas Kelapa VIII. *Prosiding Konferensi Nasional Kelapa VIII*, 73–78.

Khazalina, T. (2020). *Saccharomyces cerevisiae* in making halal products based on conventional biotechnology and genetic engineering. *Journal of Halal Product and Research*, *3*(2), 88. https://doi.org/10.20473/jhpr.vol.3-issue.2.88-94

Mujdalipah, S. (2016). Pengaruh Ragi Tradisional Indonesia Dalam Proses Fermentasi Santan Terhadap Karakteristik Rendemen, Kadar Air, Dan Kadar Asam Lemak Bebas Virgin Coconut Oil (VCO). *Fortech*, *1*(1), 10–15. http://ejournal.upi.edu/index.php

Standar Nasional Indonesia : Cara Uji Minyak dan Lemak, (1998) (testimony of Badan Standardisasi Nasional).

Patty, P. V. (2015). Pengaruh Lama Fermentasi Terhadap Ranciditas Minyak Kelapa Yang Diproduksi Secara Tradisional. *BIOPENDIX: Jurnal Biologi, Pendidikan Dan Terapan*, *1*(2), 146–152. https://doi.org/10.30598/biopendixvol1issue2page146-152

Pontoh, J. (2008). *Kualitas Virgin Coconut Oil Dari Beberapa Metode Pembuatan*. *1*(1), 60–65. https://doi.org/10.35799/cp.1.1.2008.28

Sherliana, S., Sitorus, I. M., Putri, N. P., Melati, A. R., & Putra, K. A. (2021). Pengaruh Penambahan Massa *Saccharomyces cerevisiae* Terhadap Perolehan Minyak Kelapa Murni (Virgin Coconut Oil) Dengan Metode Fermentasi. *Jurnal Chemurgy*, *5*(2), 72. https://doi.org/10.30872/cmg.v5i2.6324

Sinurat, D. I., & Silaban, R. (2021). Analysis of the Quality of Used Cooking Oil Used in Frying Chicken. *Indonesian Journal of Chemical Science and Technology (IJCST)*, *4*(1), 21. https://doi.org/10.24114/ijcst.v4i1.23091

Widjaja, W. P., & Anjarsari, B. (2014). OPTIMASI KONDISI FERMENTASI PADA PEMBUATAN MINYAK KELAPA (Cocos nucifera L) DENGAN MENGGUNAKAN *Saccharomyces cerevisiae*. *Jurnal Agroteknologi*, *8*(01), 85–93. https://jurnal.unej.ac.id/index.php/JAGT/article/view/2262

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Growth Overview and Parenting Patterns of Toddlers in Wonokromo District, Surabaya

Umi Hanik[1], Budhi Setianto[2,3], Agus Aan Adriansyah[4]

[1] *Department of Nursing, Faculty of Nursing and Midwife, Universitas Nahdlatul Ulama Surabaya, 60237, East Java, Indonesia*
[2] *Head of Public Relations and Marketing, Rumah Sakit Islam Surabaya, Surabaya, East Java*
[3,4] *Department of Public Health, Faculty of Health, Universitas Nahdlatul Ulama Surabaya, 60237, East Java, Indonesia*

ARTICLE INFORMATION

Received: September 27, 2023
Revised: February 16, 2024
Available online: February 2024

KEYWORDS

Parenting Patterns, Growth, Child Health, Behavior

CORRESPONDENCE

E-mail: umihanik@unusa.ac.id

A B S T R A C T

RW 07 Wonokromo Subdistrict is a densely populated neighborhood characterized by a diverse culture that includes immigrants and permanent residents. Health cadres conduct activities related to measuring the growth and development of babies. This encourages researchers to investigate and describe parental parenting patterns and their implications for child development. This research uses a qualitative approach to describe parental parenting patterns and their impact on children's social-emotional development. Ninety-seven sources of information were consulted to gather relevant data for the study. Data collection involved measuring the age, height, and weight of toddlers. The technique employed for data collection was non-test, utilizing observation and questionnaires. As a data collection technique, observation involves observing patterns of human behavior in specific situations to gain insights into the desired phenomenon. Observation sheets were prepared and developed based on breastfeeding, complementary feeding (MPASI), family behavior, and parenting patterns toward children. Findings from the study revealed that while the informants displayed good knowledge and commitment regarding breastfeeding, not all of them provided colostrum to newborns. Mothers exhibited commendable activities in preparing and feeding food, with supervision during satisfactory meals. All mothers fulfilled their duties of accompanying their children during meals. The study also indicated that mothers played a vital role in maintaining children's health, focusing on body and oral hygiene. Mothers actively participated in establishing habits such as bathing their children regularly (2–3 times a day), using soap, and ensuring regular teeth brushing (2 times a day). Additionally, mothers ensured that children received sufficient rest during both day and night.

INTRODUCTION

Children are the nation's next generation who deserve attention and have the right to achieve cognitive and social development (Masruroh et al., 2022). As candidates for the nation's next generation, children's growth and development quality need serious attention. Growth is an increase in physical size, such as weight and height. Developing is the increasing ability of the body's structures and functions to become more complex, such as the baby's ability to move from rolling over to sitting, standing, and walking (Rachmawati, 2014). In the world, children's growth and development problems consist of stunting, wasting, and being overweight. Based on data taken globally by the World Health Organization (WHO) in 2020, 149.2 million children under the age of 5 experienced stunting, 45.4 million experienced wasting, and 38.9 million children experienced excess weight body (overweight) (Salsabila et al., 2021).

Parenting is the way, style, or method of parents in treating, educating, guiding, and disciplining children in the maturation process through an interaction process that is influenced by many factors, such as culture, religion, habits, and beliefs so that children can grow and develop according to their knowledge. , moral values, and standards of behavior that apply in the social environment and society (Setyaningsih &

https://doi.org/10.33086/jhs.v17.i01.5214

Agustini, 2014). is the attitude or treatment of parents toward children, each of which influences the child's behavior, including the child's emotional, social, and intellectual competence (Sri, 2019). A good parenting style is a parenting style that is filled with love, affection, and tenderness and is accompanied by the implementation of teaching that is appropriate to the child's age and intelligence development level, which will be the key to the child's goodness in the future (Ayun, 2017).

Several factors influence parenting patterns on children's growth and development, including (Pangestu et al., 2017), namely as follows: (1) Socio-economic level. Parents who come from a middle socio-economic level behave more warmly compared to those from a low socio-economic level. (2) Education level. Parents with a higher level of education in their parenting practices are seen reading articles more often to see their children's development. In comparison, parents with a lower level of education tend to be authoritarian and treat their children strictly. (3) The personality of parents greatly influences parenting patterns. Conservative parents tend to treat their children strictly and authoritarianly. (4) Number of children. Parents with only 2 to 3 children tend to provide more intensive care, where interactions between parents and children emphasize personal development and cooperation between family members. Research that has been carried out on child growth and development is about factors related to child growth or development, such as the relationship between food intake and child growth or development (Utami, 2019). This analysis studies the relationship between food consumption and care with growth and development—Joint development of children (Pangestu et al., 2017). Determining a child's nutritional status refers to the Children's Anthropometric Standards table and child growth charts, but the graphs better describe children's growth trends. Both tables and graphs use the same threshold (President of the Republic of Indonesia, 2021). To determine a child's nutritional status, using either tables or charts, it is necessary to pay attention to the four standard anthropometric indices simultaneously so that growth problems can be determined to carry out preventive measures and further management (Ministry of Health of the Republic of Indonesia, 2020).

According to previous research, children's growth and development are related to children's food intake and care (Harahap et al., 2018). More than 40 percent of Indonesian children experience growth and development disorders. Developmental disorders occur while still in the womb. Therefore, it is essential to pay attention to the health of pregnant women. After birth, the risk of stunting begins at 0.5 years of age (Harahap et al., 2018). Likewise, Lelo & Liutani (2023) stated that parenting styles significantly affect social development. It was found that when children take part in learning activities in class, they have self-awareness in the form of an independent attitude in choosing activities and completing assignments from the teacher, a sense of responsibility towards themselves and others, a willingness to share, help and accompany friends who are experiencing difficulties. In activities, respecting the excellence of others, in this case, admiring the work of others and having an enthusiasm for learning.

https://doi.org/10.33086/jhs.v17.i01.5214

Parenting and parental behaviour influence children's independence and bravery in social life. This research aims to provide an overview of parenting patterns and maternal behavior regarding the association of food intake and care with child growth and development (Lelo & Liutani, 2023). RW 07 Wonokromo. Health cadres carry out baby weighing activities to measure the growth and development of babies so that researchers are encouraged to study and describe parental parenting patterns and their implications for child development. Based on this explanation, the problem in this research is the parenting patterns and behavior of parents and their impact on child development. Meanwhile, this research aims to describe parental parenting patterns and their implications for children's social-emotional development.

METHOD

This research uses a qualitative approach. This research was conducted at Posyandu RW 07 Wonokromo Village, and as many as 97 sources provided data related to this research. Data collection took the form of measuring the age, height, and weight of toddlers. The data collection technique used was a non-test, while the methods used in this research were observations and questionnaires. Observation is a data collection technique that observes patterns of human behavior in certain situations to obtain information about the desired phenomenon. Observation sheets are prepared and developed based on breastfeeding, MPASI, behavior, and family parenting patterns toward children.

RESULT

Table 1. Characteristics of Information Sources for Posyandu RW 07, Wonokromo Village, Surabaya City

No	Characteristics	Frequency	Percentage
	Mother's Age		
1	< 22 Years	18	18.6%
2	22 - 25 Years	28	28.9%
3	26 - 30 Years	19	19.6%
4	31- 35 Years	32	33.0%
	Family Income		
1	<UMR (minimum standards)	50	51.5%
2	>UMR (minimum standards)	47	48.5%
	Mother's Education		
1	Junior High School	21	21.6%
2	Senior High School	56	57.7%
3	Bachelor	20	20.6%
	Mother's Profession		
1	Government employees	12	12.4%
2	Private	25	25.8%
3	Housewife	60	61.9%
	Number of Children		
1	Two	35	36.1%
2	One	36	37.1%
3	Three	26	26.8%
	Grand Total	97	100.0%

https://doi.org/10.33086/jhs.v17.i01.5214

Table 1 provides information that most of the sources of information are aged 31 - 35 years with a family income of less than the minimum wage. Mother's education: Most are in senior high school and have the status of housewife with one child. The following is the process of giving breast milk.

Table 2. Process of Providing Breast Milk Source of Information Posyandu RW 07, Wonokromo Village, Surabaya City

No	Process of Providing Breast Milk	Frequency	Percentage
Providing Colostrum			
1	Yes	26	26.8%
2	No	71	73.2%
When Breast Milk Doesn't Come Out			
1	Keep Trying	94	96.9%
2	Ask the Doctor	1	1.0%
3	Replace Formula Milk	2	2.1%
Given for 0 - 6 Months			
1	Asi	96	99.0%
2	Formula milk	1	1.0%
What is given when the mother is not beside the baby			
1	Asi	79	81.4%
2	Formula milk	18	18.6%
Breastfeeding			
1	Milked and Given	74	76.3%
2	Formula milk	19	19.6%
3	Side by side	4	4.1%
	Grand Total	97	100.0%

Table 2 provides information that most mothers do not give colostrum when breast milk comes out for the first time; mothers still try to provide breast milk even though the amount of milk coming out is small and only give breast milk at the age of 0 - 6 months. Mothers still breastfeed even though they are not next to the baby by expressing and providing breast milk. The following is the mother's behavior in preparing food.

Table 3 Mother's Behavior in Preparing Meals at Posyandu RW 07, Wonokromo Village, Surabaya City

No	Mother's Behavior in Preparing Meals	Frequency	Percentage
Children's Breakfast Habits			
1	Yes	93	95.9%
2	No	4	4.1%
Breakfast in 1 Week			
1	4 - 6 Times	95	97.9%
2	1 - 3 Times	2	2.1%
How to Feed Mother			
1	Fed	97	100.0%
Fed How Many Times Labels			
1	Two times	24	24.7%
2	Three times	72	74.2%
3	Four times	1	1.0%
Supervision in eating alone			
1	Supervised	96	99.0%
2	Not Supervised	1	1.0%
Preparing Your Meals			
1	Yes always	95	97.9%
2	Yes Sometimes	1	1.0%
3	No	1	1.0%
Always Persuaded in Spending Food			
1	Yes	84	86.6%

https://doi.org/10.33086/jhs.v17.i01.5214

No	Mother's Behavior in Preparing Meals	Frequency	Percentage
2	Sometimes	10	10.3%
3	Never	3	3.1%
It provides a pleasant dining atmosphere.			
1	Yes always	57	58.8%
2	Yes Sometimes	13	13.4%
3	Seldom	25	25.8%
4	Never	2	2.1%
	Grand Total	97	100.0%

Table 3 provides information that the mother's habit of feeding her child is to serve breakfast 4-6 times every week, served by the mother herself. The mother's habit is feeding the child three times a day. Mothers always supervise children who eat by themselves, provide a pleasant atmosphere, and persuade them to finish their food. The following are mothers' parenting habits.

Table 4 Mother's Behavior in Parenting Habits at Posyandu RW 07, Wonokromo Village, Surabaya City

No	Mother's Behavior in Parenting Habits	Frequency	Percentage
Childcare			
1	Family members	93	95.9%
2	Neighbor	2	2.1%
3	Home Assistant	2	2.1%
Bathing Children			
1	2 - 3 Times	97	100.0%
Bathing With Soap			
1	Yes	93	95.9%
2	No	4	4.1%
Brush your teeth			
1	≥ 2 times	86	88.7%
2	One time	8	8.2%
3	Never	3	3.1%
Sleep on Time			
1	Yes always	86	88.7%
2	Yes, often	7	7.2%
3	Yes, sometimes	2	2.1%
4	Never	2	2.1%
Nap			
1	Yes always	87	89.7%
2	Yes, often	3	3.1%
3	Yes, sometimes	5	5.2%
4	Never	2	2.1%
Play With Peers			
1	Yes always	66	68.0%
2	Yes, often	13	13.4%
3	Yes, sometimes	14	14.4%
4	Never	4	4.1%
	Grand Total	97	100.0%

Table 4 provides information that most of the care is carried out by the mother and family themselves, the habit of using soap 2-3 times is a good habit and brushing their teeth more than two times a day, mothers also make it a habit always to take their children to bed on time and take naps. and play with peers.

https://doi.org/10.33086/jhs.v17.i01.5214

DISCUSSION

Mother's milk (ASI) is the best food for newborn babies, whether babies are born full-term (mature) or preterm (premature). Various research results show that breastfeeding provides many physiological and emotional benefits (Harahap et al., 2018). The World Health Organization (WHO) recommends exclusive breastfeeding for at least the first six months of age, and similar recommendations are also supported by the American Academy of Pediatrics (AAP), Academy of Breastfeeding Medicine, as well as by the Indonesian Pediatrician Association (IDAI).

Much scientific evidence shows that breast milk given exclusively during the first six months of life can meet the baby's nutritional needs for growth and development. Some examples include colostrum (breast milk on days 1-5), which is rich in protein; breast milk lactose as a source of carbohydrates is absorbed better than formula milk (Adhimah, 2020).

Exclusive breastfeeding is defined as breastfeeding without supplementation with food or drink other than medication. After six months, breast milk cannot meet the needs of minerals such as iron and zinc, so to meet these needs, MP ASI (complementary foods for breast milk), which are rich in iron, must be given (Awaludin, 2019). Premature babies, babies with low birth weight, and babies who have hematological disorders who do not have adequate iron reserves at birth generally require iron supplementation before the age of 6 months, which can be given together with exclusive breastfeeding. What needs to be understood in breastfeeding is that breast milk production is not always the same every day, namely between 450 - 1200 ml per day, so if you feel that production is decreasing in 1 day, you are not confident that it will continue like that. Even 1-2 days later, the amount will exceed the average to meet the baby's needs cumulatively. In this study, knowledge regarding breast milk and the informants' commitment was good, but not all informants gave colostrum to newborn babies (Rahmadhita, 2020).

Children generally snack once or twice a day to stay energized. Replace sweet or salty snacks, such as candy and chips, with healthier foods: nuts, cheese, and yogurt. Eating fresh ingredients is only sometimes possible, but try to limit the consumption of processed foods (Salsabila et al., 2021). Ready-to-eat foods, packaged snacks, and sweets are usually high in saturated fat, sugar, and salt. Make cooking and eating a fun routine with your family. Cooking and eating together is a great way to build a healthy family routine, warm up family relationships, and have fun together. This research found that mothers' activities in preparing meals, feeding, and supervision regarding eating were considered good; all mothers carried out their duties and functions in terms of accompanying children to eat (Rachmawati, 2014).

Maintaining healthy teeth and mouth is an important aspect that must be held at all ages, including children (Sasmita, 2021). However, teaching oral hygiene to children takes work. A child often avoids being told to brush his teeth. The earlier you teach this habit, the easier it is for children to do it as a routine (Lonang & Normawati, 2022). Then, when is the right time to teach children to start brushing

https://doi.org/10.33086/jhs.v17.i01.5214

their teeth? To prevent this from happening to children, the easiest way to do this is to teach children the habit of brushing their teeth. Brushing teeth must be part of a child's learning process, as children are accustomed to bathing, dressing cleanly, and washing their hands before eating (Sasmita, 2021). Brushing one's teeth is done when the first tooth grows in the child's oral cavity, but getting children used to cleaning their oral cavity can be done from when the child is born. In this research, the mother's role in maintaining children's health, especially in terms of body and mouth hygiene, has gone well; the mother's participation in getting the child used to regularly bathing 2-3 times every day using soap and a regular toothbrush two times a day. As well as providing sufficient rest time both day and night.

CONCLUSION

In this study, the informants' knowledge regarding breastfeeding and commitment was good, but not all gave colostrum to newborn babies. Mothers' activities in preparing food, feeding, and supervision regarding eating are considered good; all mothers carry out their duties and functions regarding accompanying children to eat. In this research, the mother's role in maintaining children's health, especially in terms of body and mouth hygiene, has gone well; participation in mothers who get their children into the habit of bathing regularly 2-3 times every day using soap and brushing their teeth regularly two times a day. As well as providing sufficient rest time both day and night.

REFERENCES

Adhimah, S. (2020). Peran orang tua dalam menghilangkan rasa canggung anak usia dini (studi kasus di desa karangbong rt. 06 rw. 02 Gedangan-Sidoarjo). *Jurnal Pendidikan Anak*, *9*(1), 57–62. https://doi.org/10.21831/jpa.v9i1.31618

Awaludin. (2019). Analisis Bagaimana Mengatasi Permasalahan Stunting Di Indonesia? *Jurnal Kedokteran*, *35*(4), 60.

Ayun, Q. (2017). Pola Asuh Orang Tua dan Metode Pengasuhan dalam Membentuk Kepribadian Anak. *ThufuLA: Jurnal Inovasi Pendidikan Guru Raudhatul Athfal*, *5*(1), 102. https://doi.org/10.21043/thufula.v5i1.2421

Harahap, H., Budiman, B., & Widodo, Y. (2018). Gangguan Pertumbuhan Dan Perkembangan Pada Anak Usia 0,5-1,9 Tahun Terkait Dengan Asupan Makanan Dan Pengasuhan Yang Kurang. *Gizi Indonesia*, *41*(1), 49. https://doi.org/10.36457/gizindo.v41i1.247

Kementrian Kesehatan Republik Indonesia. (2020). *Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 Tentang Standar Antropometri Anak* (Vol. 7, Issue 2). http://repository.radenintan.ac.id/11375/1/PERPUS PUSAT.pdf%0Ahttp://business-law.binus.ac.id/2015/10/08/pariwisata-syariah/%0Ahttps://www.ptonline.com/articles/how-to-get-better-mfi-results%0Ahttps://journal.uir.ac.id/index.php/kiat/article/view/8839

Lelo, K., & Liutani, D. N. (2023). Peran Pola Asuh Orang Tua dan Implikasinya terhadap Perkembangan Sosial-Emosional Anak. *Jurnal PG-PAUD Trunojoyo : Jurnal Pendidikan Dan Pembelajaran Anak Usia Dini*, *10*(1), 74–83. https://doi.org/10.21107/pgpaudtrunojoyo.v10i1.17783

Lonang, S., & Normawati, D. (2022). Klasifikasi Status Stunting Pada Balita Menggunakan K-Nearest Neighbor Dengan Feature Selection Backward Elimination. *Jurnal Media Informatika Budidarma*, *6*(1), 49. https://doi.org/10.30865/mib.v6i1.3312

Masruroh, N., Rizki, L. K., Ashari, N. A., & Irma, I. (2022). Analisis Perilaku Ibu Menyusui dalam Memberikan ASI Eksklusif di Masa Pandemi Covid 19 di Surabaya (Mix Method). *Muhammadiyah Journal of Midwifery*, *3*(1), 1. https://doi.org/10.24853/myjm.3.1.1-10

Pangestu, S., Saparahayuningsih, S., & D, D. (2017). Kemandirian Anak Dalam Pembelajaran Pengembangan Sosial Emosional. *Jurnal Ilmiah Potensia*, *2*(2), 86–90.

President of The Republic of Indonesia. (2021). *Peraturan Presiden Republik Indonesia Nomor 72Tahun 2021, Percepatan Penurunan Stunting* (Issue 1).

Rachmawati. (2014). Pengetahuan, Sikap dan Prilaku Ibu dalam Pemenuhi Gizi Balita. *Jurnal Keperawatan Indonesia*, *17*(3), 88–94.

Rahmadhita, K. (2020). Permasalahan Stunting dan Pencegahannya. *Jurnal Ilmiah Kesehatan Sandi Husada*, *11*(1), 225–229. https://doi.org/10.35816/jiskh.v11i1.253

Salsabila, A., Anit Fitriyan, D., Rahmiati, H., Sekar, M., Sarita Dewi, M., Syifa Uttami, N., Gonzales, R., Qamara Dewi, R., Valya Puspita Aryatri, R., Azzahra, V., Herdayati, M., Studi Kesehatan Masyarakat, P., Kesehatan Masyarakat, F., Indonesia, U., Duren Seribu, P., Bojongsari, K., & Depok, K. (2021). Upaya Penurunan Stunting Melalui Peningkatan Pola Asuh Ibu. *Jurnal Pengabdian Kesehatan Masyarakat: Pengmaskesmas*, *1*(2), 103–111.

Sasmita, L. C. (2021). Prevention of Childhood Stunting Problems With the Mayang–Wati Program. *Jurnal Layanan Masyarakat (Journal of Public Services)*, *5*(1), 140. https://doi.org/10.20473/jlm.v5i1.2021.140-150

Setyaningsih, S. R., & Agustini, N. (2014). Pengetahuan, Sikap, dan Perilaku Ibu dalam Pemenuhan Gizi Balita: Sebuah Survei. *Jurnal Keperawatan Indonesia*, *17*(3), 88–94. https://doi.org/10.7454/jki.v17i3.451

Sri, Y. (2019). Stimulasi Tumbuh Kembang Anak. *Psympathic Jurnal Ilmiah Psikologi*, *III*(1), 121–130.

Utami;, T. W. P. M. N. A. (2019). *Studi Deskriptif Kemandirian Anak Kelompok B di PAUD Segugus Lavender*. *4*(2), 151–160.

Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya
ISSN 1978-6743
E-ISSN 2477-3948

The Influence of Knowledge and Attitudes on Clean and Healthy Living Behavior in Class V and VI Students at SD Negeri 8 Simpang Rimba South Bangka Regency in 2023

Mico Hanjiansyah[1], *Gita Fajrianti*[2], *Rendita Dwibarto*[3], *Max McArthur*[4]

[1,2,3] *University of Anak Bangsa, Pangkalpinang, Indonesia*
[4] *Health Care at Boston Consulting Group, University of Melbourne, Australia*

ARTICLE INFORMATION

Received: January 17, 2024
Revised: February 16, 2024
Available online: February 2024

KEYWORDS

Knowledge, PHBS, Attitude

CORRESPONDENCE

E-mail: micovivo76@gmail.com

A B S T R A C T

Students are the primary assets for future development, and their health must be prioritized and protected. A significant portion of children's health issues stem from unhealthy behaviors within the school environment. Promoting clean and healthy living behaviors in schools is an initiative aimed at enhancing the awareness of school residents to prevent diseases and create a hygienic environment. This initiative should be based on the knowledge and attitudes of each student. The objective of this research was to investigate the influence of knowledge and attitudes on clean and healthy living behaviors among class V and VI students at SD Negeri 8 Simpang Rimba, South Bangka district. The research design employed was cross-sectional. The population comprised 171 respondents, with a sample of 71 respondents, including 31 from class V and 40 from class VI. Univariate data analysis and multiple linear regression tests were conducted. The impact of student knowledge and attitude variables on clean and healthy living behavior was assessed through T-tests. The results indicated that the T-test values (2.357 > 1.666 and 2.044 > 1.066) with corresponding p-values (0.021 < 0.05 and 0.045 < 0.05) suggested a significant influence. The calculated F-test (5.019 > 3.128) further supported the significance of the overall influence, with an F significance value (0.009 < 0.05) below the alpha level. In conclusion, there is a positive combined influence of knowledge and attitudes on clean and healthy living behavior among class V and VI students at SD Negeri 8 Simpang Rimba, South Bangka district in 2023.

INTRODUCTION

Students are school age children at pre-school, elementary school, middle school and high school levels, especially elementary school children because the age of elementary school children is very different from that of adults. School is the right place for students to provide knowledge about the importance of having clean and healthy living behavior at school (Abidah & Huda, 2018). Clean and Healthy Living Behavior (*PHBS* in Indonesian) is a health behavior carried out with awareness by a person in order to be able to help themselves and play an active role in activities in the health sector (Indriastuti *et al*., 2021).

According to the Ministry of Health of the Republic of Indonesia in 2017, the number of districts/cities that have a PHBS policy is 313 (60.89%). In 2018 there were 363 PHBS policies (70.62%). In 2019, 423 (82.30%) districts/cities had PHBS policies (Kemenkes RI, 2019). Berdasarkan data Riskesdas tahun 2013 menunjukkan bahwa pencapaian PHBS sebesar 32,3%, sedangkan pada Riskesdas tahun 2018 menunjukkan bahwa 68,74%. Based on Riskesdas data in 2013, it shows that PHBS achievement was 32.3%, while in Riskesdas in 2018 it showed that it was 68.74% (Riskesdas, 2013). According to Riskesdas, the clean and healthy living behavior development program designed by the government has been running for 15 years, but its success has not yet reached the targets set (Riskesdas, 2018).

https://doi.org/10.33086/jhs.v17.i01.5595

Based on data obtained from the Kep provincial Health Service. Bangka Belitung shows that the percentage of households with PHBS from 7 districts/cities in 2022 is highest in Bangka district at 69.38% and the lowest in West Bangka district at 30.74% and South Bangka district is in the third lowest position for households with-PHBS of 57.97% (Dinkes Bangka Belitung, 2022).

Implementing PHBS in schools has a good influence on students because it can create a clean and healthy environment so that the teaching and learning process of students and teachers in the school environment runs smoothly, whereas PHBS can also have bad influences, such as decreasing achievement and enthusiasm for learning. The most important factor in forming healthy living behavior is based on a person's knowledge and attitudes. If someone has good knowledge and attitude, they will not be easily influenced by objects around them, and vice versa (Srisantyorini & Ernyasih, 2020). Healthy living leads to individual healthy behavior in the form of actions to improve and maintain optimal health for each individual (Nurmala *et al*., 2020).

The results of the research show that in implementing the 8 PHBS indicators in schools, firstly, students have carried out the habit of washing their hands with soap and running water well. Second, most students have a bad attitude because they buy food outside the school canteen. Third, not all students have had their weight and height measured even though the use of UKS at the school is already available. Fourth, students already have a good attitude in using the toilets provided by the school, but there are also some students who rarely use the toilets at school. Fifth, most students already have a good attitude towards throwing away rubbish in the right place. Sixth, most students already have good attitudes because they have received information from physical education teachers through lessons scheduled once a week regarding the importance of regular and measurable exercise. Seventh, students still have a less caring attitude and lack knowledge about the dangers of mosquito larvae because students see puddles of water containing mosquito larvae that remain in place and leave them alone. Eighth, the school's teachers and students have very good behavior because they have complied with the issue of not smoking in the school environment. It is hoped that it can provide benefits for students so that they can improve their health, enthusiasm for learning and learning productivity (Taryatman, 2016). Therefore, it is necessary for each student to be aware of the importance of knowledge and attitudes in implementing PHBS at school.

METHOD

This research uses a cross-sectional research approach with a cross-sectional design which aims to determine whether there is an influence of knowledge and attitudes on clean and healthy living behavior in class V and VI students at SD Negeri 8 Simpang Rimba, South Bangka Regency. This research was conducted from September-October 2023. The population in this research was all students in grades V and

https://doi.org/10.33086/jhs.v17.i01.5595

VI of SD Negeri 8 Simpang Rimba for the 2023/2024 academic year, totaling 171 respondents. The sample in this research was some of the students in grades V and VI of SD Negeri 8 Simpang Rimba for the 2023/2024 academic year, totaling 71 respondents. In collecting data using questionnaires and interviews. The questionnaire consists of four parts, namely part A contains the respondent's identity, part B consists of questions related to knowledge, part C consists of questions related to attitudes, part D consists of questions related to PHBS.

The data analysis used univariate analysis to describe the frequency distribution of each variable and the Multiple Linear Regression test to determine the influence of the independent and dependent variables. This research has been approval by the Health Research Ethics Committee University of Anak Bangsa Pangkalpinang with Number: 03/470/UNABA/VII/2023.

RESULT

Tabel 1 Frequency Distribution of Knowledge in Class V and VI Students

Knowledge	Amout	Percent (%)
Tall	5	7
Enough	5	7
Not Enough	61	85,9
Total	71	100

Source: Primary Data (2023)

Based on table 1, it shows that students' knowledge shows that 71 respondents have poor knowledge, namely 61 (85.9%) more, compared to high and sufficient knowledge with the same number, namely 5 (7%).

Tabel 2 Frequency Distribution of Attitude in Class V dan VI Students

Attitude	Amount	Percent (%)
Not Good	36	50,7
Good	35	49,3
Total	71	100

Source: Primary Data (2023)

Based on table 2, it shows that the attitudes of the 71 respondents who had less good attitudes were 36 (50.7%) more than those with good attitudes, namely 35 (49.3%).

Tabel 3 Frequency Distribution of PHBS in Class V dan VI Students

PHBS	Amount	Percent (%)
Not Good	36	50,7
Good	35	49,3
Total	71	100

Source: Primary Data (2023)

Based on table 3, it shows that there are 36 (50.7%) more PHBS in schools than 71 respondents who implemented PHBS poorly, compared to 35 (49.3%) students who implemented PHBS well.

https://doi.org/10.33086/jhs.v17.i01.5595

Tabel 4 T Test of the Effect of Knowledge and Attitudes on Clean and Healthy Living Behavior in Students Classes V and VI at SD Negeri 8 Simpang Rimba, South Bangka Regency

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.473	.332		1.423	.159
	Knowledge	.241	.102	.267	2.357	.021
	Attitude	.231	.113	.231	2.044	.045

Source: Primary Data (2023)

Based on table 4, the T test results for the knowledge variable are 2.357, meaning T count > T table (2.357 > 1.666) and the p value is 0.021 < 0.05, stating that there is an influence of knowledge on clean and healthy living behavior in class V and VI students in SD Negeri 8 Simpang Rimba, South Bangka Regency. Meanwhile, the attitude variable, the results of the T test, show a value of 2.044, meaning T Count > T Table (2.044 > 1.066) and a p value of 0.045 < 0.05, indicating that there is an influence on attitudes towards students in grades V and VI at SD Negeri 8 Simpang Rimba, South Bangka Regency.

Tabel 5 F Test of the Effect of Knowledge and Attitudes on Clean and Healty Living Behavior in Students Classes V dan VI at SD Negeri 8 Simpang Rimba, South Bangka Regency

Model		Sum of Squares	df	Mean Square	f	Sig.
1	Regression	2.283	2	1.141	5.019	.009
	Residual	15.464	68	.227		
	Total	17.746	70			

Source: Primary Data (2023)

Based on table 5, it can be seen from the F test results that the calculated F value > F table (5.019 > 3.128) is obtained, while the sig value of 0.009 < p value (0.05) means that together (simultaneously) all the independent variables consisting of knowledge and attitudes have a significant influence on clean and healthy living behavior at school.

DISCUSSION

Human knowledge is obtained through the sense of hearing and the sense of sight (Febrina *et al.*, 2022). This research shows that the frequency value of students' knowledge in the less category is 61 respondents. This is caused by internal factors in the form of physical and spiritual as well as external factors in the form of education (Muzdalia *et al.*, 2022). The results of the univariate analysis showed that 61 (85.9%) students' knowledge was in the low category, while 5 (7%) students were in the high and sufficient categories who received the same number. This means that students' knowledge of PHBS in the low category is more in the high and sufficient categories. The results of data analysis using multiple linear regression tests in the T test results for the knowledge variable show a value of 2.357, meaning T Count > T Table (2.357 > 1.666) with a p value of 0.021 < 0.05, which means knowledge has an influence on clean and healthy living behavior at school. with a constant value of 0.241, it states that the independent variable

https://doi.org/10.33086/jhs.v17.i01.5595

is considered constant, so each student carries out PHBS 0.241 times. It can be concluded that H0 is rejected, and Ha is accepted, which means that there is an influence of knowledge on class V and VI students at SD Negeri 8 Simpang Rimba, South Bangka Regency.

This research is supported by research conducted Dwiyanti (2023) with the title the influence of knowledge about clean and healthy living behavior in the workplace on attitudes towards using personal protective equipment for Bunda Hotel Group employees with the results showing that the p value is 0.000 < 0.05 so it can be concluded that knowledge about PHBS at work has a significant effect on attitudes towards using PPE with a constant of 0.567 states that the independent variable is considered constant so each employee implements PHBS 0.567 times.

Attitude is a response from someone who is still close to a stimulus or object. Attitude is a person's assessment of objects in health matters, including disease (Siregar, 2020). Univariate analysis showed that attitudes were in the poor category for 36 (50.7%) and good for 35 (49.3%). This means that attitudes in the unfavorable category are more numerous in the good category. This is in line with research Chandra et al., (2017) which states that negative attitudes are more numerous than positive attitudes where PHBS students are in the poor category 82.4% and 17.6% good. Emotional attitudes towards social stimuli clearly show the appropriateness of reactions to certain stimuli or objects which in everyday life are influenced by factors of personal experience, mass media, the influence of other people and culture.

The results of data analysis using the multiple linear regression test in the T test results for the attitude variable show a value of 2.044, meaning T Count > T Table (2.044 > 1.066) with a p value of 0.045 < 0.05, which means attitude has an influence on clean and healthy living behavior at school. with a constant value of 0.231, it states that the independent variable is considered constant, so each student carries out PHBS 0.231 times.

It can be concluded that H0 is rejected, and Ha is accepted, which means that there is an influence on attitudes towards class V and VI students at SD Negeri 8 Simpang Rimba, South Bangka Regency. The results of this study are in line with research Kusyanti & Yulita (2019) regarding the influence of providing knowledge and attitudes on the implementation of germas for healthy living, a p value of 0.034 <0.05 was obtained, so it was concluded that germas was influenced by attitudes where the constant was 1.352, indicating that the independent variable was considered constant so each family implemented germas 1.353 times.

Based on the table, the results of research using the Simultaneous test or F test obtained a calculated value > F table (5.019 > 3.128) with a p value of 0.009 because the p value is much smaller than 0.05, which means there is a positive influence of knowledge and attitude together. towards clean and healthy living behavior in class V and VI students at SD Negeri 8 Simpang Rimba. This is in line with the research

https://doi.org/10.33086/jhs.v17.i01.5595

conducted Kusyanti & Yulita (2019) with the title the influence of knowledge and attitudes on the implementation of community movements for healthy living with research results showing that the calculated F value was 1.356 with a probability of 0.001 because the probability is much smaller than 0.05, so the regression model can be used to see the joint influence of knowledge and attitudes towards the healthy society movement.

This research explains that knowledge and attitudes can influence students to be aware of clean and healthy living behavior at school. Students who have broad knowledge and positive attitudes towards PHBS will have a high awareness of having clean and healthy lifestyle behavior because students know the importance of PHBS for everyday life to create healthier behavior.

CONCLUSION

Based on the research results, it can be concluded that the majority of 85.9% of respondents have insufficient knowledge regarding clean and healthy living behavior at school with a calculated T value > T Table (2.357 > 1.666) and a p value of 0.021 < 0.05 which means knowledge has influence on clean and healthy living behavior in class V and VI students at SD Negeri 8 Simpang Rimba. Respondents' attitudes towards PHBS were in the poor category as much as 50.7% with a value obtained T Count > T Table (2.044 > 1.066) with a p value of 0.045 < 0.05 which means attitude has an influence on clean and healthy living behavior in class students V and VI at SD Negeri 8 Simpang Rimba. Furthermore, the variables between knowledge and attitude together influence clean and healthy living behavior with the calculated F value > F table (5.019 > 3.128) and the p value (0.009 < 0.05) which means there is a positive influence of knowledge and attitude together towards clean and healthy living behavior in class V and VI students at SD Negeri 8 Simpang Rimba.

REFERENCES

Abidah, Y.N. and & Huda, A. (2018) ‘Implementation of the clean and healthy living behavior (PHBS) program in special schools’, *Journal Ortopedagogia*, 4(2), pp. 87–93.

Chandra, C., Fauzan, A. and Aquarista, M.F. (2017) ‘The Relationship Between Knowledge and Attitudes and Clean and Healthy Living Behavior (PHBS) in Elementary School (SD) Students in Cerbon District in 2016’, *Journal Public Health (Public Health) Khatulistiwa*, 4(3), pp. 201–205.

Dinkes, Bangka Belitung. (2022) ‘Data on PHBS Households', Pangkalpinang City

Dwiyanti, R. (2023) ‘The Influence of Knowledge About Clean and Healthy Living Behavior in the Workplace on Attitudes in Using Personal Protective Equipment of Bunda Bukittinggi Hotel Group Employees’, Journal of Tourism Applied Science, 8(2), pp. 70–79.

Febrina, W. *et al.* (2022) ‘Educating Elementary School Students Regarding Healthy Snacks’, Journal of Competitive Service, 1(2), pp. 98–104.

Indriastuti, D.R. and SE, Ms. (2021) 'Pocket Book Building Community Awareness to Have a Clean and Healthy Lifestyle'. Surakarta: Surakarta: Unisri Press.

https://books.google.com/books?hl=id&lr=&id=XrybEAAAQBAJ&oi=fnd&pg=PP1&dq=indriastuti+buku+saku&ots=MnEeC_le-z&sig=0FrMXKK0fpvbXJ2Vx5cvIeImF_0.

Kemenkes RI (2019) '2019 Indonesian Health Profile, Ministry of Health of the Republic of Indonesia' Jakarta: Kemenkes RI. Available at: https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-indonesia-2019.pdf.

Kusyanti, F. and Yulita, I.K. (2019) 'The Influence of Knowledge and Attitudes on the Implementation of the Healthy Living Community Movement', in Proceedings of the National Multidisciplinary Science Seminar, pp. 139–146.

Muzdalia et al. (2022) 'Study Health Promotion' Bandung: Eksismedia Grafisindo. Available at: https://books.google.com/books?hl=id&lr=&id=wJdpEAAAQBAJ&oi=fnd&pg=PA1&dq=Muzdalia,+I.,+Ns,+S.+K.,+Sri+Darmawan,+S.+K.+M.,+Sakka,+L.,+Farm,+S.,+%26+Muzakkir,+S.+S.+(2022).+&ots=QkurP_sdLU&sig=K-dw4B0lNn03F6GAo0UjzEzKCfA.

Nurmala, Ira., *et al* (2020) *'Health Promotion'* Surabaya: Airlangga University Press.

https://books.google.com/books?hl=id&lr=&id=SGvIDwAAQBAJ&oi=fnd&pg=PA1&dq=ira+nurmala+promosi+kesehatan+buku&ots=FieDH6BAEK&sig=E3YF0-z4fzH2k_5WXqJq0uz5cmg.

Riskesdas (2013) '2013 Basic Health Research Results' Jakarta: Kementerian Kesehatan RI. Available at: https://doi.org/10.1517/13543784.7.5.803.

Riskesdas (2018) '2018 Basic Health Research Results' *Kementrian Kesehatan RI*. Jakarta: Kementerian Kesehatan RI.

Siregar, P.A. (2020) 'Health Promotion Textbook, Health Promotion Textbook' Medan: UIN Sumatera Utara. Available at: http://repository.uinsu.ac.id/8775/1/Diktat Dasar Promkes.pdf.

Srisantyorini, T. and Ernyasih, E. (2020) 'The Relationship between Students' Knowledge and Attitudes towards Clean and Healthy Living Behavior at SD Negeri Sampora 1, Cisauk District, 2018', *Muhammadiyah Public Health Journal*, 1(1).

Taryatman, T. (2016) 'Clean and Healthy Living Culture in Elementary Schools to Build a Young Generation with Character', *TRIHAYU:* Journal of Elementary Education, 3(1).

Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya
ISSN 1978-6743
E-ISSN 2477-3948

Spiritual Therapy: Dzikir and Worship on Patient's Ability to Control Violent Behavior in Mental Hospital

Retno Twistiandayani[1], Dimas Hadi Prayoga[1], *Icha Nora Ervina*[1]

[1,2] *Gresik University, Gresik, Indonesia*

ARTICLE INFORMATION

Received: January 25, 2024
Revised: February 5, 2024
Available online: February 2024

KEYWORDS

Violent Behavior, Spiritual Therapy, Dzikir, Worship

CORRESPONDENCE

E-mail: twistiandayani@unigres.ac.id

A B S T R A C T

Violent behavior is when someone engages in actions that can cause physical harm to themselves, others, or the environment. This research aims to analyze the effect of spiritual therapy prayer, dzikir, on patients' ability to control violent behavior. The research design employed a Pre-Experiment approach with a Pretest-Posttest Control Group Design. The target population included all Muslim patients with a history of violent behavior who were physically healthy and cooperative in the Gelatik Room at Menur Mental Hospital, Surabaya, totaling 27 people. A probability sampling technique, specifically simple random sampling, was used for the sampling method. The independent variable was spiritual therapy prayer and worship, while the dependent variable was the patient's ability to control violent behavior. The instrument used is the Standard Operational Procedure (SOP), and data were analyzed using the Wilcoxon Rank Test statistical test. The results of the Wilcoxon Rank Test in the treatment group ($p = 0.005$, $\alpha < 0.05$) indicate an influence of spiritual therapy dzikir and worship—on the patient's ability to control violent behavior. Post-intervention, the different tests revealed a significant difference in the ability to control violent behavior between the intervention and control groups ($p = 0.005$). The provision of spiritual therapy demonstrated an increase in the average score of patients' ability to control violent behavior. This is attributed to the influence of spiritual beliefs on health and behavior in patient care, fostering increased confidence and a sense of closeness to Allah SWT.

INTRODUCTION

Violent behavior is individual behavior aimed at injuring or harming other individuals who do not want this behavior to occur (Aritonang, 2020). Patients with violent behavior can control their behavior if given several Implementation Strategies (SP). The implementation strategy (SP) carried out by clients with violent behavior is a discussion about how to control violent behavior physically, medicinally, verbally, and spiritually (Sujarwo and Livana, 2019). Therapeutic activities that have been provided at the Menur Mental Hospital for patients with violent behavior include exercise, walking, listening to music, and playing. However, some of these activities still do not reduce the level of violent behavior in patients. The prevalence of patients with violent behavior worldwide is around 24 million people; more than 50% of patients with violent behavior do not receive treatment. World Health Organization (WHO) data in 2019 shows that 300 thousand mental disorder patients in the United States commit violent behavior every year (Laia and Pardede, 2022). Riskesdes data shows in 2018 years that the prevalence rate of mental disorders in East Java is number 12 in Indonesia. According to Rosdiana, Male and Hastutiningtyas (2023), it is stated that the estimated number of severe mental disorders in East Java reaches 0.19% of the total population of East Java, 39,872,395. Based on a literature study, medical record data from Menur Mental

https://doi.org/10.33086/jhs.v17.i01.5623

Hospital, East Java Province found nursing problems in inpatients, namely, in 2021 there were 15,263 people, with details of violent behavior 41.11%, hallucinations 32.11%, social isolation 14.2 %, self-care deficit 5.3%, low self-esteem 3.2%, delusions 2.2%, and risk of suicide 1.3% (Medical record data from Menur Mental Hospital (2021). The impact that can occur if a patient with violent behavior cannot control his violent behavior is that he can injure himself, other people, and the surrounding environment.

Treatment carried out to control violent behavior is by medical and non-medical methods. Non-medical therapy can be carried out by carrying out mind-body therapy, namely providing interventions with various techniques to facilitate thinking capacity that influences physical symptoms and body functions, for example, imagery, yoga, music therapy, prayer, journaling, biofeedback, humor, tai chi, and art therapy (Stanley, 2014). Spiritual treatment is very influential in building a sense of self-acceptance so that clients no longer feel depressed and regret their fate. According to Muhith (2015), the general aim of spiritual therapy is to prevent violent behavior through regular spiritual activities. To prevent violent behavior, ask each patient about their religion and beliefs and discuss their usual worship activities, ask the patient to choose one of the worship activities, and ask the patient to demonstrate the chosen worship activity (Samsualam, 2020). Based on the background description above, researchers are interested in researching "Spiritual Therapy: dzikir and Worship on the Patient's Ability to Control Violent Behavior".

METHOD

This type of quantitative research uses a Pre-Experimental research design with a Pretest-Posttest Control Group Design approach. In this design, both groups are first given an initial test (pretest) with the same test. The intervention group was assigned special treatment, namely spiritual therapy, carried out for two weeks, which was carried out three times a week with the help of a duty nurse in the Gelatik room, while the control group was not given spiritual therapy. After being given treatment, both groups were tested with the same test as the final test (posttest); the results of the two tests were compared, as were the results of the initial and final tests in each group (Ahmad *et al.*, 2023). The target population for this research was all patients with violent behavior who were Muslim, physically healthy, and cooperative in the Gelatik Room at the Menur Mental Hospital, Surabaya, totaling 27 people. The sampling technique used in this research is probability sampling, namely simple random sampling. The instruments in this research were the Standard Operational Procedure (SOP) for spiritual therapy and the Menur Mental Hospital assessment observation sheet modified by the researcher. The independent variable in this research is spiritual group activity therapy. The dependent variable in this study is the patient's ability to control violent behavior. This research was conducted at Menur Mental Hospital, Surabaya, from 22 May 2023 to 03 June 2023, with ethical approval from the Research Ethics Committee (KEP) of Menur Mental Hospital Number: 070/1773/102.8/2023. The data, which was in ordinal form, was processed and analyzed using the

https://doi.org/10.33086/jhs.v17.i01.5623

Wilcoxon Test statistical test to determine the difference in the dependent variable before and after treatment with a significance level of $p \leq 0.05$. It was carried out using the Mann-Whitney Test to investigate the difference between the two treatment and control groups; if the significance level is $p \leq 0.05$, then there is a difference between the intervention group and the control group in the ability to control violent behavior.

RESULT

The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Intervention Group

Table 1 The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Intervention Group at Menur Mental Hospital Surabaya Starting 22 May - 03 June 2023

Characteristics	Pre-test Intervensi		Post-test Intervensi	
	f	%	f	%
Low	2	25.0	0	00,0
Medium	6	75.0	2	25.0
High	0	00,0	6	75.0
Totally	8	100.0	8	100.0
Mean	1,7500		2,7500	
Standard Deviation	0,46291		0,46291	
Wilcoxon Test	P = 0.05			

The research results showed that before being given spiritual group activity therapy in the intervention group, there were some respondents with medium criteria, namely six respondents (75.0%) and a small number with low criteria (25%). After being given spiritual therapy, dzikir, and worship in the treatment group, it was found that the ability of respondents to control the violent behavior of some respondents with high criteria was six respondents (75.0%). The research results show that the average (mean) value before being given spiritual therapy was 1.7500 with a standard deviation value of 0.46291, while the average (mean) value after being given spiritual therapy was 2.7500 with a standard deviation value of 0. 46291. The results of the Wilcoxon test data analysis in the intervention group obtained a value of $p = 0.005$, meaning $p < 0.05$, so H1 was accepted, meaning spiritual therapy influences the patient's ability to control violent behavior in mental hospitals.

The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Control Group

https://doi.org/10.33086/jhs.v17.i01.5623

Table 2 The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Control Group at Menur Mental Hospital, Surabaya from 22 May - 03 June 2023

	Pre-test Kontrol		Post-test Kontrol	
Characteristics	f	%	f	%
Low	5	62.5	5	62.5
Medium	2	25.0	2	25.0
High	1	12.5	1	12.5
Totally	8	100.0	8	100.0
Mean	1,5000	1,5000	1,5000	1,5000
Standard Deviation	0,75593	0,75593	0,75593	0,75593
Wilcoxon Test	p = 1.000			

The results of the research in the control group show that the average value (mean) before being given spiritual therapy was 1.5000 with a standard deviation value of 0.46291, while the average value (mean) after being given intervention from the hospital (pharmacology) was 1.500 with the normal deviation value is 0.75593. The results of the Wilcoxon test data analysis in the intervention group obtained a value of p = 1.000, meaning p $\geq$ 0.05, so H1 was rejected, which means there was no effect of spiritual therapy on the patient's ability to control violent behavior in the mental hospital in the control group.

Differences in Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Intervention and Control Group

Table 3 Differences in Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Intervention and Control Group at Menur Mental Hospital, Surabaya, Starting 22 May - 03 June 2023

	Pre		Post	
Characteristics	Intervention	Control	Intervention	Control
Mean	9,63	7,38	11.63	5,38
Mann Whitney	23.00		7.000	
Wilcoxon	59.00		43.00	
Uji Mann Whitney	0,289		0,005	

The results of the research showed that the significance value of the difference between the intervention group and the control group before being given the intervention was not significantly different (p = 0.289), meaning that there was no difference in the ability to control violent behavior between the intervention group and the control group, so it could be said that the two groups were homogeneous. Then, after being given the intervention, the results of the different tests showed a difference in the ability to control violent behavior between the intervention group and the control group (p = 0.005). The mean rank score in the intervention group was 11.53, higher than the mean rank score in the control group, namely 5.38, meaning that the intervention provided significantly increased the ability to control violent behavior.

DISCUSSION

The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Intervention Group

https://doi.org/10.33086/jhs.v17.i01.5623

One of the causes of violent behavior is age and gender. The results of the research show that respondents based on the age of patients with violent behavior at the Menur Mental Hospital in the intervention group, most of the respondents were aged 25-50 years, namely seven people (87.5%). At this productive age, individuals have demands for self-actualization, whether from oneself, family, or the environment. This is due to the individual's ability to be involved in family life, society, and work and to guide their children. Individuals adjust independently to social life, and most people in early adulthood can decide problems rationally, so they are stable and emotionally mature (Twistiandayani and Pranata, 2016). Spiritual beliefs can influence health levels and patient behavior. Meeting spiritual needs develops a sense of gratitude, patience, and sincerity in a person (Triyani, Dwidiyanti and Suerni, 2019). Providing spiritual therapy with dzikir (Subhanallah 33×, Alhamdulillah 33×, Allahuakbar 33×), listening to 3 letters (Al-Ikhlas, Al-Falaq, An-Naas), Worship can reduce stress hormones and cause natural endorphins to be active so that feelings of relaxation increase and attention from fear, anxiety and tension can be diverted, as well as improving the body's chemical system thereby lowering blood pressure and slowing breathing, heart rate and wave activity. Brain. This deeper or slower breathing rate is perfect for causing calm, emotional control, deeper thinking, and better metabolism (Fitriani, 2017). Increasing the patient's ability to control violent behavior in the intervention group, eight respondents obtained the highest score, namely four scores by two respondents due to the therapeutic influence of spiritual group activities for two weeks, which was carried out three times in 1 week. This is in line with research by Indrianingsih, Hasanah and Utami (2023) that spiritual remembrance therapy can help reduce signs and symptoms of the risk of violent behavior with an average percentage before implementation of 57.1%. The average after implementation was 21.3%.

The Effect of Providing Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Control Group

The control group only took medication from the hospital. The drugs consumed by respondents in the control group were anti-psychotic drugs, atypical anti-psychotic drugs, anti-anxiety drugs, and anti-seizure drugs. The effect of the drug is to reduce or eliminate hallucinations and delusions, provide a calming effect, and relax the muscles so that the body relaxes and overcomes seizures. However, the violent behavior of respondents in the control group was not trained, so the criteria for violent behavior remained the same. Psychopharmacological drugs are divided into several types based on their use in treating mental disorders, including antianxiety (drugs to treat anxiety), antipsychotics (drugs to treat psychosis/schizophrenia), antidepressants (drugs to treat depression), mood stabilizers (to treat mood disorders/bipolar/mania) and so on (Brunton, Lazo and Parker, 2006). This shows that pharmacology helps reduce violent behavior, but from the research results, there was no effect before and after the intervention in the control group. Based on the results of the interviews, it was found that most respondents were obedient to taking medication. However, the time to take medication and its implementation was

https://doi.org/10.33086/jhs.v17.i01.5623

sometimes late. Treatment factors are one of the things that can influence a patient's ability to control violent behavior, based on research results showing that all patients were treated 1-5 times. The recurrence rate is positively related to the number of hospital admissions, duration, and disease course. Patients who relapse usually have the characteristics of being hyperactive before being discharged from the hospital, do not want to take medication, and have few social skills (Twistiandayani and Pranata, 2016).

Differences in Spiritual Therapy: Dzikir and Worship on the Ability to Control Violent Behavior in the Implementation and Control Group

When carrying out spiritual therapy, the average score for the patient's ability to control violent behavior will be higher because spiritual beliefs can influence the level of health and behavior in patient care so that patients will become more confident and feel closer to Allah SWT. So, there is a therapeutic effect of spiritual group activities on the patient's ability to control violent behavior. The results of this research are in line with Wahyu's research that there is an effect of increasing the ability to control auditory hallucinations after being given spiritual therapy: dzikir (Samsualam, 2020). If spiritual treatment is carried out continuously and if the patient often follows a religious therapy schedule, it will have a more substantial influence in helping the patient control violent behavior and calm his heart. This will make patients more confident and feel closer to Allah SWT. Based on the research results, it was found that there were differences in spiritual therapy in the treatment and control groups. This happened because the treatment group experienced an increase in their ability to control their violent behavior, while in the control group, it remained the same. If spiritual therapy is carried out continuously and if the patient often follows a religious therapy schedule, it will have a more substantial influence in helping the patient control violent behavior and calm his heart. This will make patients more confident and feel closer to Allah SWT. In line with Dwidiyanti (2018), The Effect of Islamic Spiritual Mindfulness on the Medication Adherence of Patients with Psychiatric and Mental Health Disorder using quasi-experimental pre-test and post-test methods, the results showed that the Islamic spiritual mindfulness intervention given to 11 respondents had increased in compliance with taking medication. A case study on a schizophrenic patient who underwent a mindfulness intervention with a spiritual approach using the calming technique method showed that the patient was able to feel calm and the patient was able to control anger. This indicates that providing spiritual therapy improves the patient's ability to control their violent behavior compared to just giving medication/pharmacology.

CONCLUSION

The patient's ability to control violent behavior before being given spiritual group activity therapy in the intervention group was found by most respondents at medium criteria; after being given spiritual therapy, dzikir, and worship, most respondents were found at high criteria, so there was an influence of spiritual

https://doi.org/10.33086/jhs.v17.i01.5623

treatment on the ability to control violent behavior. The patient's ability to control violent behavior before and after spiritual therapy in the control group showed the same results at low criteria. This research also indicates that there are differences between the treatment group and the control group after the intervention in controlling their violent behavior abilities. Providing spiritual therapy shows that the average score of patients' ability to control violent behavior increases because spiritual beliefs can influence the level of health and behavior in patient care so that patients will become more confident and feel closer to Allah SWT.

REFERENCES

Ahmad, E.H. *et al.* (2023) *Metodologi Penelitian Kesehatan*. Rizmedia Pustaka Indonesia.

Aritonang, M. (2020) 'Analisis Pengaruh Terapi Aktivitas Kelompok Stimulus Persepsi terhadap Kemampuan Pasien Mengontrol Perilaku Kekerasan di RSJ Prof. Ildrem Medan Tahun 2019', *Jurkessutra: Jurnal Kesehatan Surya Nusantara*, 8(2).

Brunton, L.L., Lazo, J.S. and Parker, K.L. (2006) 'Goodman & Gilman's The Pharmacological Basis of Therapeutics. McGraw-Hill', *New York, USA* [Preprint].

Dwidiyanti, M. (2018) 'The Effect of "Mindfulness Spiritual Islam" on the Medication Adherence of Patients with Psychiatric and Mental Health Disorder', *J Holist Nurs* [Preprint].

Fitriani, D.R. (2017) 'Hubungan antara Persepsi dengan Sikap Keluarga dalam Menangani Anggota Keluarga yang Mengalami Skizofrenia di RSJD Atma Husada Mahakam Samarinda: The Correlation Between Perception And Family Attitude Toward Family Members Who Experience Schizophrenia At ', *Jurnal Ilmu Kesehatan*, 5(1), pp. 20–26.

Indrianingsih, F., Hasanah, U. and Utami, I.T. (2023) 'Penerapan Terapi Spiritual Zikir pada Pasien Risiko Perilaku Kekerasan di Ruang Melati Rumah Sakit Jiwa Daerah Provinsi Lampung', *Jurnal Cendikia Muda*, 3(2), pp. 268–275.

Laia, V.A.S. and Pardede, J.A. (2022) 'Penerapan Terapi Generalis Pada Penderita Skizofrenia Dengan Defisit Perawatan Diri Di Ruang Pusuk Buhit Rsj Prof. dr. Muhammad Ildrem: Studi Kasus'.

Muhith, A. (2015) *Pendidikan keperawatan jiwa: Teori dan aplikasi*. Penerbit Andi.

Rosdiana, Y., Male, M.W. and Hastutiningtyas, W.R. (2023) 'Hubungan Dukungan Keluarga dengan Perawatan Diri pada Pasien Gangguan Jiwa di Desa Bantur, Puskesmas Bantur, Kabupaten Malang', *Journal of Nursing Care and Biomoleculer*, 8(2).

Samsualam, S. (2020) 'Pengaruh Pelaksanaan Terapi Spiritual Terhadap Kemampuan Pasien Mengontrol Perilaku Kekerasan', *Window of Health Jurnal Kesehatan*, 3(1), pp. 49–56.

Stanley, D. (2014) 'Complementary and alternative therapies', *Kozier & Erb's Fundamentals of Nursing Australian Edition*, 3, p. 369.

Sujarwo, S. and Livana, P.H. (2019) 'Studi Fenomenologi: Strategi Pelaksanaan Yang Efektif Untuk Mengontrol Perilaku Kekerasan Menurut Pasien Di Ruang Rawat Inap Laki Laki', *Jurnal Keperawatan Jiwa*, 6(1), pp. 29–35.

Triyani, F.A., Dwidiyanti, M. and Suerni, T. (2019) 'Gambaran terapi spiritual pada pasien skizofrenia: literatur review', *Jurnal ilmu keperawatan jiwa*, 2(1), pp. 19–24.

Twistiandayani, R. and Pranata, F. (2016) 'Dukungan Keluarga dalam Merawat Klien Menurunkan Resiko Kekambuhan Perilaku Kekerasan (Family Support in Caring for Clients Decrease Risk of Recurrence Violent Behavior)', *Journals of Ners Community*, 7(2), pp. 101–112.

https://doi.org/10.33086/jhs.v17.i01.5623

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

The Role of Bay Leaf Extract in Reducing Liver Inflammation in Mice (Mus Musculus) Induced by Potassium Oxonate

Evy Silvia Awwalia[1,2], Hotimah Masdan Salim[3], Mochammad Faishal Riza[4], Mulyadi[5]

[1] *Department of Internal Medicine, Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Indonesia*
[2] *Department of Internal Medicine, RSIS Jemursari Hospital, Surabaya, Indonesia*
[3] *Department of Biochemistry and Biomolecular Science, Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Indonesia*
[4] *Department of Cardiovascular Medicine, Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Indonesia*
[5] *Department of Pulmonology, Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya, Indonesia*

ARTICLE INFORMATION

Received: January 22, 2024
Revised: January 24, 2024
Available online: February 2024

KEYWORDS

Bay Leaf, Hyperuricemia, potassium oxonate., inflammation, liver cells

CORRESPONDENCE

E-mail: dr.hotimah@unusa.ac.id

A B S T R A C T

Hyperuricemia is characterized by elevated uric acid levels in the blood, often stemming from increased uric acid production or inadequate uric acid excretion, resulting in levels exceeding 7 mg/dL. If left unmanaged, this condition can lead to gout arthritis. Elevated serum uric acid levels have also been linked to liver damage, as evidenced by findings in patients diagnosed with Non-alcoholic fatty liver disease (NAFLD), showing increased serum uric acid levels associated with liver damage. This study investigates the potential role of bay leaf extract in reducing liver inflammation related to uric acid metabolism. This study employed a true experimental approach with a post-test control group design, utilizing 8-week-old Mus musculus as experimental animals. The groups were divided as follows: Group 1 (control), Group 2 (Potassium oxonate-PO), Group 3 (PO with administration of bay leaf extract at 75mg/kg body weight), Group 4 (PO with administration of bay leaf extract at 150mg/kg body weight), and Group 5 (PO with administration of bay leaf extract at 300mg/kg body weight). Histological examination of the liver in the PO administration group revealed cell infiltration compared to the control group. However, a significant reduction in damaged hepatocyte cells was observed by administering bay leaf extract in PO+EDS-1, PO+EDS-2, and PO+EDS-3 groups ($P<0.05$). Bay leaf extract demonstrates hepatoprotective effects in hyperuricemia induced by potassium oxonate.

INTRODUCTION

Hyperuricemia occurs when the kidneys fail to excrete uric acid, which results in elevated uric acid levels. The high levels of uric acid occur due to the deposition of monosodium crystals resulting from the breakdown of purines or a combination of both. Uric acid is excreted into the kidneys with urine. However, the decreased secretion of uric acid into the renal tubules is due to disturbances in uric acid elimination in the kidneys, leading to increased uric acid levels in the blood (Ningtiyas & Ramadhian, 2016). High uric acid levels can be caused by foods high in purines (>200 mg/100 g) (Kaneko et al., 2014). The clinical manifestations of hyperuricemia typically include pain because uric acid stimulates the production of proinflammatory cytokines interleukin-1β (IL-1β), interleukin-6 (IL-6), interleukin 8 (IL-8), and tumor necrosis factor-α (TNF-α), which induce leukocyte migration to areas of monosodium crystal deposition, exacerbating the inflammatory response (Mardiana et al., 2012). Allopurinol and febuxostat are anti-hyperuricemia drugs that work by reducing or inhibiting the production of the enzyme xanthine oxidase (Dien et al., 2005). Allopurinol is one of the drugs used to lower blood uric acid levels.

https://doi.org/10.33086/jhs.v17.i01.5613

Allopurinol works by inhibiting the enzyme xanthine oxidase to convert hypoxanthine to xanthine, which becomes uric acid. However, allopurinol can cause side effects such as allergic reactions on the skin, fever, and others.

One plant believed to have efficacy in treating uric acid-related diseases by reducing blood uric acid levels is bay leaf extract (Syzygium polyanthum). Previous studies have shown that ethanol from bay leaves can lower blood uric acid levels, supported by flavonoid compounds with anti-inflammatory properties (Sinaga et al., 2014). Generally, flavonoid compounds can be found in the leaves or flowers of a plant (Panche et al., 2016). Based on literature (Muhtadi et al., 2012), bay leaf content that has anti-hyperuricemia abilities includes the flavonoids quercetin, myricetin, and fluorettin, which can inhibit the action of xanthine oxidase by reducing the production of xanthine oxidase enzyme.

However, the discovery regarding the effect of bay leaves on liver inflammation caused by increased uric acid levels is still uncertain. Therefore, this study aims to determine the role of bay leaf extract in reducing liver inflammation related to uric acid metabolism.

METHOD

This study is a true experimental research with the test control Group Design. The research was conducted at the integrated research laboratory of the Faculty of Medicine, UNUSA, and the pharmacology laboratory of the Faculty of Medicine, UNAIR.

Experimental Materials

Potassium oxonate (PO) (Sigma-Aldrich Co., MO, USA), a uric oxidase inhibitor, was applied to induce acute hyperuricemia.

Preparation of Syzygium polyanthum Extract (Wight.)

Bay leaves were macerated using 96% ethanol in a ratio of 7.5 times the weight of the test material. Maceration was carried out for five days, stirring once a day. After five days, each macerate was filtered using a flannel cloth. Each macerate was then evaporated using a rotary evaporator at 70˚C until a sufficient filtrate was obtained. The filtrate was poured into a porcelain dish and further heated with a water bath at 70˚C until a thick extract was formed.

Experimental Animals

This study used Mus musculus experimental animals divided into five groups: Group 1 was the control (Control), Group 2 was hyperuricemia (K2 PO), Group 3 was hyperuricemia, and Syzygium polyanthum Wight extract 75mg/kg body weight, Group 4 was hyperuricemia and Syzygium polyanthum Wight extract 150mg/kg body weight, and Group 5 was hyperuricemia and Syzygium polyanthum Wight extract 300 mg/kg body weight given for two weeks.

https://doi.org/10.33086/jhs.v17.i01.5613

Histological Analysis

All sacrificed animals on day 14 were removed, fixed in 10% formalin solution, and processed using paraffin. Sections with a thickness of 5 µm were cut and stained with hematoxylin and eosin (H&E) for histological examination.

Statistical Analysis

All results are expressed as mean ± SEM. An unpaired student's t-test was performed to compare the parameters of the two groups. Dose-response curve comparisons were made using two-way repeated measures, ANOVA, and Tukey's posthoc test for intergroup comparisons. A P-value <0.05 was considered significant.

RESULT

The Effect of Bay Leaf Extract on Hepatic Histological Features

Observations on hepatic histology in this study were conducted using hematoxylin and eosin staining and viewed under a light microscope. The histological changes in the liver in the PO administration group in this study were significantly pronounced compared to the control group. Cell infiltration and hepatocyte cell necrosis were observed (Figure 1).

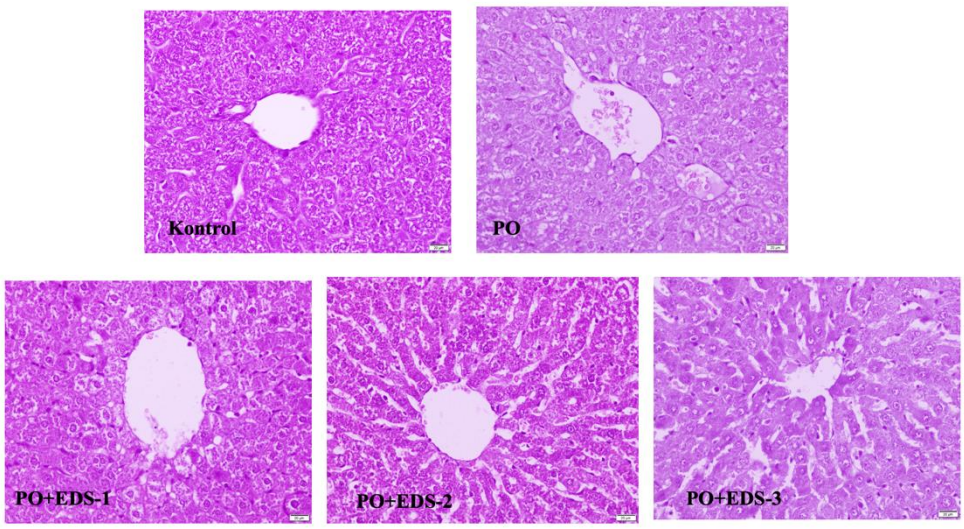


Figure 1. Hepatic histology of PO; potassium oxonate group, PO+EDS-1; potassium oxonate and bay leaf extract dose 75 mg/kg BW group, PO+EDS-2; potassium oxonate and bay leaf extract dose 150 mg/kg BW group, PO+EDS-3; potassium oxonate and bay leaf extract dose 300 mg/kg BW group

The Effect of Bay Leaf Extract on Hepatocyte Cells

Histological observations of the liver were conducted in five different fields of view at 400x magnification. In each field of view, 20 cells were randomly counted, and 100 liver cells were observed in one preparation. These observations were then recorded, and the percentage of damage was calculated. In Figure 1, hepatocyte cell necrosis was observed and subsequently quantified. There was a significant

https://doi.org/10.33086/jhs.v17.i01.5613

increase in hepatocyte cell damage in the PO group compared to the control group (P<0.01). However, the administration of bay leaf extract in the PO+EDS-1, PO+EDS-2, and PO+EDS-3 groups significantly decreased hepatocyte cell damage (P<0.05) (Table 1 and Figure 2).

Group	Hepatocyte cell damage
Control	98,25±10,27##
PO	258,75±12,5***
PO+EDS-1	210±18,25**#
PO+EDS-2	156.25±14,36**#
PO+EDS-3	109,5±12.15##

Table 1. Effect of Bay Leaf Extract on Hepatocyte Cell Damage. PO; potassium oxonate group, PO+EDS-1; potassium oxonate and bay leaf extract dose 75 mg/kgBW group, PO+EDS-2; potassium oxonate and bay leaf extract dose 150 mg/kgBW group, PO+EDS-3; potassium oxonate and bay leaf extract dose 300 mg/kgBW group. Data represent mean ± SD. *P<0.05, **P<0.01, ***P<0.001 compared to the control group. #P<0.05 and ## P<0.01 compared to the PO group.

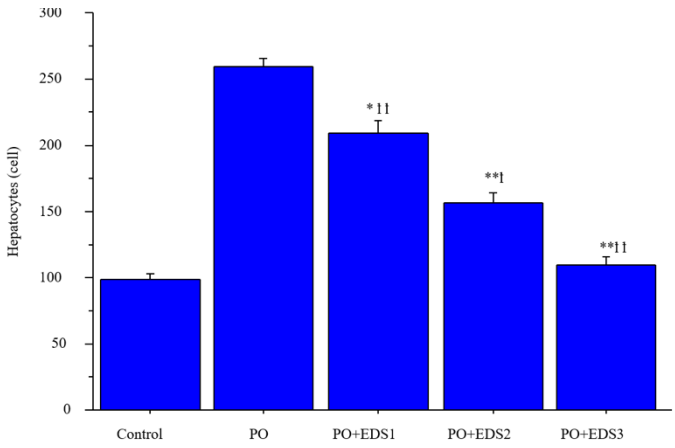


Figure 2. Hepatocyte Cell Damage. PO; potassium oxonate group, PO+EDS-1; potassium oxonate and bay leaf extract dose 75 mg/kgBW group, PO+EDS-2; potassium oxonate and bay leaf extract dose 150 mg/kgBW group, PO+EDS-3; potassium oxonate and bay leaf extract dose 300 mg/kgBW group. Data represent mean ± SD

DISCUSSION

Hyperuricemia can occur due to the accumulation of uric acid in the body, leading to increased purine levels. Purines in the body can be converted into endogenous uric acid by xanthine oxidase enzymes in the blood. This mechanism causes elevated uric acid levels in the blood and prevents maximal excretion. Flavonoids can reduce uric acid levels by inhibiting the activity of xanthine oxidase enzymes (Khalid et

https://doi.org/10.33086/jhs.v17.i01.5613

al., 2019). This study found that administering methanol extract from bay leaves reduced hepatocyte cell damage induced by potassium oxonate in hyperuricemia.

The decrease in damaged hepatocytes in this study suggests that the higher the dose of bay leaf extract administered, the lower the decrease in hepatocyte cell damage, particularly at a 300 mg/kg BW dose. This may be influenced by the contents of bay leaves, including fluorettin, quercetin, and myricetin (Muhtadi et al., 2012). Flavonoid content in bay leaves also acts as an antioxidant, inhibiting xanthine oxidase enzyme activity and inhibiting uric acid formation (Harismah, 2016).

Flavonoids such as apigenin, kaempferol, luteolin, fluorettin, quercetin, and myricetin have been found to inhibit xanthine oxidase activity by producing hydrogen peroxide and superoxide anions during the oxidation of hypoxanthine to xanthine and uric acid (Harismah, 2016). The highest inhibition of xanthine oxidase activity is seen in flavonols and planar flavonoids with a 7-hydroxyl group. Hydroxyl groups from chrysin and luteolin at C-5 and C-7 of the flavonoid skeleton have potent inhibitory effects on xanthine oxidase activity (Tungmunnithum et al., 2018)

Quercetin compounds in bay leaf ethanol extract are believed to inhibit xanthine oxidase activity. The inhibition of xanthine oxidase reduces endogenous uric acid production, lowering uric acid levels in the blood (Darussalam & Rukmi, 2019). Additionally, a study has stated that bay leaf extract can reduce serum IL-6 and TNF-α levels in hyperuricemia patients, with the delta value of bay leaf extract reducing uric acid greater than allopurinol, although statistically, it did not show significant differences. The decrease in TNF-α values corresponds to the clinical condition, where bay leaf extraction as a uric acid reducer can reduce pain in hyperuricemia patients (Choi et al., 2014). Furthermore, previous research has found that methanol extract of bay leaves has a hepatoprotective effect in diabetes mellitus models (Salim et al., 2022). Inhibition of xanthine oxidase and reduction of inflammatory mediators by bay leaf extract administration are some of the factors contributing to the reduction of damaged hepatocyte cells and its role as hepatoprotective in the hyperuricemia mode.

CONCLUSION

Based on the conducted research, it can be concluded that the methanol extract of Bay Leaf (Syzygium polyanthum (Wight) Walp) influences reducing damaged hepatocytes and acts as a hepatoprotective agent in potassium oxonate-induced hyperuricemia in experimental animals.

REFERENCES

Choi, Y.-J., Shin, H.-S., Choi, H. S., Park, J.-W., Jo, I., Oh, E.-S., Lee, K.-Y., Lee, B.-H., Johnson, R. J., & Kang, D.-H. (2014). Uric acid induces fat accumulation via generation of endoplasmic reticulum stress and SREBP-1c activation in hepatocytes. *Laboratory Investigation, 94*(10), 1114–1125. https://doi.org/10.1038/labinvest.2014.98

Darussalam, M., & Rukmi, dwi kartika. (2019). *The Role Of Boiled Water Of Syzygium Polyanthum Leaves In Decreasing Hyperuricemia Levels*. *September*.

Dien et al., 2013, Guillermo Garcia-Manero Shao-Qing Kuang, Susan O'Brien, Deborah Thomas, and Hagop Kantarjian, H. Y., & Jones, R. (2005). 基因的改变NIH Public Access. *Bone*, *23*(1), 1–7. https://doi.org/10.1002/acr.21773.2012

Harismah, K. and C. (2016). PEMANFAATAN DAUN SALAM (Eugenia polyantha) SEBAGAI OBAT HERBAL DAN REMPAH PENYEDAP MAKANAN. *WARTA LPM*, *19*(2), 110–118.

Kaneko, K., Aoyagi, Y., Fukuuchi, T., Inazawa, K., & Yamaoka, N. (2014). Total Purine and Purine Base Content of Common Foodstuffs for Facilitating Nutritional Therapy for Gout and Hyperuricemia. *Biological and Pharmaceutical Bulletin*, *37*(5), 709–721. https://doi.org/10.1248/bpb.b13-00967

Khalid, M., Saeed-ur-Rahman, Bilal, M., & HUANG, D. (2019). Role of flavonoids in plant interactions with the environment and against human pathogens — A review. *Journal of Integrative Agriculture*, *18*(1), 211–230. https://doi.org/https://doi.org/10.1016/S2095-3119(19)62555-4

Mardiana, Kartini, A., & Widjasena, B. (2012). Media Medika. *Pemberian Cairan Karbohidrat Elektrolit, Status Hidrasi Dan Kelelahan Pada Pekerja Wanita*, *46*(14), 6–11.

Muhtadi, Andi Suhendi, Nurcahyanti W., dan E. S. (2012). THE POTENTIAL OF SALAM LEAVES (Syzigium polyanthum Walp.) AND BLACK CUMIN SEED (Nigella sativa Linn) AS A CANDIDATE STANDARIZED HERBAL MEDICINE OF URIC ACID. *FARMACON*, *3*(1), 30–36.

Ningtiyas, I. F., & Ramadhian, M. R. (2016). Efektivitas Ekstrak Daun Salam untuk Menurunkan Kadar Asam Urat pada Penderita Artritis Gout. *Medical Journal of Lampung University*, *5*(3), 105–110.

Panche, A. N., Diwan, A. D., & Chandra, S. R. (2016). Flavonoids: an overview. *Journal of Nutritional Science*, *5*, e47–e47. https://doi.org/10.1017/jns.2016.41

Saigal, R., & Agrawal, A. (2015). Pathogenesis and clinical management of gouty arthritis. *Journal of Association of Physicians of India*, *63*(DECEMBER2015), 56–63.

Salim, H. M., Kurnia, L. F., Bintarti, T. W., Handayani, H., & Shimabukuro, M. (2022). Hepatoprotective Effects of Methanol Extract of Syzygium polyanthum L. Leaves (Salam) on High Fat Diet. *Tropical Journal of Natural Product Research*, *5*(12), 2092–2095. https://doi.org/10.26538/tjnpr/v5i12.8

Sinaga, A. F., Bodhi, W., & Lolo, W. A. (2014). Uji Efek Ekstrak Etanol Daun Salam (Syzygium polyanthum (Wight .) Walp) Terhadap Penurunan Kadar Asam Urat Diinduksi Potasium Oksonat. *PHARMACON Jurnal Ilmiah Farmasi*, *3*(2), 141–145.

Tungmunnithum, D., Thongboonyou, A., Pholboon, A., & Yangsabai, A. (2018). Flavonoids and Other Phenolic Compounds from Medicinal Plants for Pharmaceutical and Medical Aspects: An Overview. *Medicines (Basel, Switzerland)*, *5*(3), 93. https://doi.org/10.3390/medicines5030093

ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

Overview of Nutritional Status in Pulmonary Tuberculosis Patients Undergoing Outpatient Treatment at Tk.II Iskandar Muda Hospital Banda Aceh

Rosi Mega Safitri[1], Hendra Kurniawan[2], Iflan Nauval[3], Kyaw Ko Ko Htet[4]

[1] *General Practitioners*
[2] *Faculty of Medicine, Universitas Syiah Kuala Banda Aceh, Indonesia*
[3] *Departement of Human Nutrition, Faculty of Medicine, Universitas Syiah Kuala Banda Aceh, Indonesia*
[4] *Faculty of Medicine, Prince of Songkla University, Thailand*

ARTICLE INFORMATION

Received: January 18, 2024
Revised: January 20, 2024
Available online: February 2024

KEYWORDS

Tuberculosis, Malnutrition, Nutritional Status

CORRESPONDENCE

E-mail: Safitrirosimega@gmail.com

A B S T R A C T

Tuberculosis (TB), caused by Mycobacterium Tuberculosis (MTB) and transmitted through the air, primarily affects the lungs. In Aceh Province, the reported TB cases reached 41,596. Nutritional status is a pivotal factor influencing TB occurrence, as malnutrition can compromise immune function, increasing susceptibility to MTB. This study assesses TB patients' nutritional status based on BMI, malnutrition risk, and body weight changes during therapy. As quantitative research with a descriptive cross-sectional study design, the study used the medical records of outpatient pulmonary TB patients at the Pulmonary & TB-DOTS Polyclinic of TK—II Iskandar Muda Banda Aceh Hospital, who underwent intensive phase therapy from January to December 2023. Malnutrition risk screening utilizes the Malnutrition Universal Screening Tools (MUST) instrument. The study revealed a high prevalence of pulmonary TB cases, particularly among individuals aged 17-25. Based on the MUST instrument, patients over 60 showed a high risk of malnutrition, with the average patient having a MUST score of 3 (indicating high risk). Most patients experienced a significant increase in body weight during the intensive treatment stage. Weight gain significantly contributes to the success of tuberculosis treatment, influencing positive changes in the nutritional status of pulmonary tuberculosis patients.

INTRODUCTION

Tuberculosis is one of the leading causes of death and a global public health problem. Based on WHO (World Health Organization) data in the Global Tuberculosis Report 2022 from 202 countries, 10.1 million people were diagnosed with tuberculosis in 2021, 10.6 million were diagnosed with tuberculosis in 2022, and 1.6 million people died from TB (including 187,000 people accompanied by HIV / Human Immunodeficiency Virus). According to RISKESDAS 2018 data, the prevalence of TB in Indonesia reached 69.2%, and the number of TB patients in Aceh Province reached 41,596 cases (Kemenkes RI, 2018; Acharya *et al.*, 2020; Bagcchi, 2023).

TB is a disease that is strongly associated with poverty, and people with TB also experience discrimination and community stigma. Multisectoral efforts to fight the causes of TB, such as hunger, malnutrition, and HIV infection, reduce mortality. Consumption of nutritious food and supplements is essential for TB prevention. Epidemiologic studies suggest that malnutrition plays a critical role in the occurrence and progression of TB cases. TB patients with severe malnutrition (BMI/Body Mass Index <16) will show clinical symptoms of dyspnea, night sweats, and hemoptysis. Low body weight is also associated with TB case relapse (Kemenkes, 2013; Nyarko *et al.*, 2021; Guo *et al.*, 2022).

https://doi.org/10.33086/jhs.v17.i01.5603

Malnutrition leads to impaired immune function and increased susceptibility to Mycobacterium Tuberculosis. Mycobacterium Tuberculosis bacterial invasion causes an acute inflammatory response that activates antibodies and boosts the body's metabolism. The acute inflammatory response in the body accelerates protein loss and inhibits serum albumin production. Increased metabolism will have the effect of decreasing appetite, leading to reduced nutritional status. The relationship between TB and malnutrition is bidirectional, as TB can also be caused by malnutrition (Kemenkes, 2013; Guo *et al.*, 2022; Ockenga *et al.*, 2023).

Malnutrition in TB patients can aggravate and require a longer time for the healing process, resulting in a risk of secondary infection. Nutritional therapy in TB can maintain and improve nutritional status, aiming to increase TB patients' life expectancy (Kemenkes, 2013; Indonesia, 2011; Guo *et al.*, 2022; Ockenga *et al.*, 2023).

This is because one factor can influence the occurrence of TB, namely nutritional status. From this background, researchers are interested in examining the description of the nutritional status of pulmonary tuberculosis patients undergoing outpatient care at Tk.II Iskandar Muda Banda Aceh Hospital. The purpose of this study was to determine the nutritional status of TB patients based on BMI, the risk of malnutrition in TB patients, and the increase in BW during TB therapy.

METHOD

This study is a descriptive study with a cross-sectional design. The population in this study were all patients diagnosed with pulmonary TB by a pulmonary specialist who was on outpatient treatment at the Pulmonary Polyclinic and TB - DOTS Tk.II Iskandar Muda Hospital Banda Aceh. The sample in this study met the inclusion criteria: diagnosis of pulmonary TB, adult age ≥ 18 years—sampling using the total sampling method. Total sampling is a sampling method in research where subjects or elements are selected as samples with all populations sampled.

The data needed are age, gender, medical diagnosis, weight, height, and weight change. This study was conducted using secondary data, which is medical record data. The population of this study was the medical records of pulmonary TB patients registered at the Pulmonary Polyclinic and TB - DOTS Tk.II Iskandar Muda Hospital from January - December 2023. The research sample is all populations meeting the inclusion criteria for research.

The data obtained were collected based on the research variables, and after the data were collected, data processing was carried out manually and computerized. Furthermore, the data will be presented as frequency distribution tables. Malnutrition risk screening in this study used the Malnutrition Universal Screening Tools (MUST) instrument.

https://doi.org/10.33086/jhs.v17.i01.5603

RESULT

The results of the research that has been carried out obtained 86 cases of Pulmonary TB—the results of the study at the Pulmonary and TB - DOTS Polyclinic of TK. II Iskandar Muda Banda Aceh Hospital found 85 patients who met the inclusion criteria with characteristics based on age and gender. Characteristics of pulmonary TB patients based on age are presented in Table 1; the characteristics of pulmonary TB patients are dominant at the age of 17-25 years with a total of 18 patients, age 26-35 years totaling ten patients, age 36-45 years totaling 16 patients, age 46-55 years totaling 15 patients, age 56-65 years totaling 16 patients, and age> 65 years totaling ten patients.

Table 1. Patient characteristics by age

Age (Years)	Frequency (n)	Percentage (%)
17-25	18	21,2%
26-35	10	11,8%
36-45	16	18,8%
46-55	15	17,6%
56-65	16	18,8%
>65	10	11,8%
Total	85	100,0%

The characteristics of pulmonary TB patients based on gender are presented in Table 2; it was found that the characteristics of pulmonary TB patients were dominant in the male gender with a total of 60 patients (70.6%) compared to the female gender with a total of 25 patients (29.4%).

Table 2. Patient characteristics by gender

Gender	Frequency (n)	Percentage (%)
Male	60	70,6 %
Female	25	29,4%
Total	85	100,0%

Data from the results of the study based on Table 3, namely the characteristics of the risk of malnutrition based on age and MUST Score, was found that the high risk of malnutrition was Pulmonary TB patients at the age of> 65 years with a total of 9 patients (90%), the dominant moderate risk of malnutrition was found at the age of 26-35 years and >65 years with one patient each (10%). Pulmonary TB patients who have a low risk of malnutrition are most dominantly found at the age of 46-55 years with a total of 8 patients (53.3%), followed by age 17-25 years with a total of 8 patients (44.4%) and age 36-45 years and age 56-65 years each seven patients (43.8%).

https://doi.org/10.33086/jhs.v17.i01.5603

Table 3. Characteristics of patient malnutrition risk based on age and MUST Score

Age (Years)	*Score* MUST						Total	
	Low		Moderate		High			
	n	%	n	%	n	%	n	%
17-25	8	44,4%	1	5,6%	9	50%	18	100%
26-35	2	20%	1	10%	7	70%	10	100%
36-45	7	43,8%	1	6,3%	8	50%	16	100%
46-55	8	53,3%	1	6,7%	6	40%	15	100%
56-65	7	43,8%	0	0%	9	56,3%	16	100%
>65	0	0%	1	10%	9	90%	10	100%
Total	32	37,6%	5	5,9%	48	56,5%	85	100%

The characteristics of the risk of malnutrition of Pulmonary TB patients based on gender and MUST Score are presented in Table 4; it was found that the male gender was dominant in having a risk of malnutrition, a high risk of malnutrition amounted to 35 patients (58.3%), a moderate risk of malnutrition with three patients (5%) and a low risk of malnutrition found 22 patients (36.7%).

Table 4. Characteristics of patient malnutrition risk based on gender and MUST Score

Gender	*Score* MUST						Total	
	Low		Moderate		High			
	n	%	n	%	n	%	n	%
Male	22	36,7%	3	5%	35	58,3%	60	100%
Female	10	40%	2	8%	13	52%	25	100%
Total	32	37,6%	5	5,9%	48	56,5%	85	100%

Data characteristics based on age and Score MUST obtain the highest data distribution at the age of> 65 years with a mean of 2.60, minimum of 1.00, maximum of 3.00, median of 3.00, and standard deviation of 0.70; this is because the data obtained at the age of> 65 years is very dominant to have a Score MUST of 3, and the least Score MUST of 1. No one has a Score MUST of 0; this means that there is a high risk of malnutrition at that age.

Table 5. Data characteristics based on age and MUST Score

Age (Years)	*Score* MUST				
	Mean	Minimum	Maximum	Median	Deviation standard
17-25	1,50	,00	3,00	1,50	1,47
26-35	2,00	,00	3,00	2,50	1,25
36-45	1,50	,00	3,00	1,50	1,46
46-55	1,27	,00	3,00	,00	1,49
56-65	1,56	,00	3,00	2,00	1,46
>65	2,60	1,00	3,00	3,00	,70
Total	1,66	,00	3,00	2,00	1,39

During intensive pulmonary TB therapy, in the first two months, most patients experienced an increase in body weight ≥ 1 kg. In the first month of OAT therapy, 70 patients (82.4%) experienced an increase in body weight, and in the second month of OAT therapy, 66 patients (77.6%) experienced an increase in body weight ≥ 1 kg from the first month.

https://doi.org/10.33086/jhs.v17.i01.5603

Table 6. Characteristics of weight gain during intensive pulmonary TB therapy

Body weight (Kg)	1st Month		2nd Month	
	n	%	n	%
BW Increased	70	82,4	66	77,6
BW unchanged or decreased	15	17,6	19	22,4
Total	85	100%	85	100%

DISCUSSION

Data distribution of pulmonary TB patients based on age is presented in Table 1; the characteristics of pulmonary TB patients are dominant at the age of 17-25 years with a total of 18 patients, age 36-45 years totaling 16 patients, age 46-55 years totaling 15 patients and age 56-65 years totaling 16 patients. Most patients with pulmonary TB in the study results are of a productive age.

Productive age is the age range of 15-59 years. Productive age has a 2-3 times greater risk of being exposed to TB germs. The productive age period is the most active period of activity outside the home for work, educational activities, and social interaction, thus increasing the risk of exposure to TB patients, which results in a straightforward process of pulmonary TB transmission (Martial, Mubarik and Yu, 2021; Agustian and Masria, 2022; Dong *et al.*, 2022).

Data characteristics of pulmonary TB patients based on gender were dominant in male patients with 60 patients (70.6%) compared to female patients with 25 patients (29.4%). Men are affected by TB at least two times more than women. Before pulmonary TB treatment, men have a higher number of bacterial smears and a shorter time to positive culture than women (Martial, Mubarik and Yu, 2021; Agustian and Masria, 2022; Dabitao *et al.*, 2022).

The relationship between gender and time to a positive culture, after adjusting for smear bacterial count. This finding confirms that males have higher bacterial counts than females. It is also possible that MTB isolates from males have an increased growth capacity faster than in females, which means that there are sex-specific host-pathogen interactions that can potentially affect disease and treatment outcomes (Martial, Mubarik and Yu, 2021; Agustian and Masria, 2022; Dabitao *et al.*, 2022).

This is in line with the results of Agustian et al.'s research, where the male gender has a greater chance of suffering from pulmonary TB because men have high mobility compared to women. Hence, the possibility of exposure is more significant; besides, habits such as smoking and consuming alcohol can make it easier for men to become infected with pulmonary TB (Agustian and Masria, 2022; Dabitao *et al.*, 2022).

Data from the results of the study based on Table 3, namely the characteristics of the risk of malnutrition based on age and Score MUST, it was found that age> 65 years with pulmonary TB had a high risk of

https://doi.org/10.33086/jhs.v17.i01.5603

malnutrition with a total of 9 patients or 90% of pulmonary TB cases aged> 65 years. Data characteristics based on age and Score MUST obtain the highest data distribution at the age of >65 years with a mean of 2.60, minimum of 1.00, maximum of 3.00, median of 3.00, and standard deviation of 0.70 this is because the data obtained at the age of >65 years is very dominant to have a MUST Score of 3, and the least has a MUST Score of 1, this means that at that age has a high risk of malnutrition.

Old age and Body Mass Index (BMI) are the main factors affecting BTA conversion at the end of standard pulmonary TB treatment. Low BMI reduces cure rates. High BMI values have a favorable impact on BTA negativity at the 6th-month visit. Old age conditions with low BMI have a higher risk of death (Thamaria, 2017; Kemenkes, 2013; Martial, Mubarik and Yu, 2021; Agustian and Masria, 2022; Dong *et al.*, 2022).

Individuals at high risk are pulmonary TB patients with chronic disease, high alcohol consumption, elderly people, individuals with immunosuppression, and vulnerable social groups (e.g., incarcerated populations, the military, and people living in densely populated environments). A validated nutritional screening and diagnostic tool that can be implemented by health professionals (e.g., nurses) with minimal training. This includes the Malnutrition Universal Screening Tool (MUST) for screening the general population's malnutrition risk (Kemenkes, 2013; Guo *et al.*, 2022; Ockenga *et al.*, 2023).

The relationship between TB and malnutrition is bidirectional because malnutrition can also be caused by TB itself and caused by cachexia, anorexia, and malabsorption associated with inflammation. Malnutrition caused by TB is characterized by a loss of fat mass regardless of BMI, including in obese and overweight individuals (Kemenkes, 2013; Guo *et al.*, 2022; Ockenga *et al.*, 2023).

Weight loss is a common condition among the elderly population, which may be caused by “physiological anorexia due to aging.” Coughing is reported to occur more frequently in adults, but dyspnea occurs more frequently in the elderly group. This is caused by several factors, namely having a history of pulmonary TB, being a former smoker or active smoker, and a BMI <18.5. The factors that have the greatest influence on pulmonary TB in the elderly are smoking and low BMI. Nutritional deficiencies in the respiratory muscles in older people can cause dyspnea (Cheng *et al.*, 2020; Ma *et al.*, 2022; Sakthivadivel, Gaur and Geetha, 2023).

Malnutrition that occurs in old age is caused by the effects of long-standing pulmonary TB disease or due to side effects of TB drugs. Apart from that, pulmonary TB in the elderly is also usually accompanied by degenerative diseases such as hypertension and CHD, which is different from the productive age group with pulmonary TB. Catabolism related to malnutrition can result in acute weight loss and malnutrition, changes in appetite regulation in older age, and postprandial metabolic changes are associated with gradual changes that result in acute weight loss and malnutrition. The increasing incidence of aspiration

https://doi.org/10.33086/jhs.v17.i01.5603

and inflammatory diseases related to old age, such as chronic obstructive pulmonary disease and pulmonary fibrosis, makes older people more likely to have a lung environment that is susceptible to infection, including TB infection (Chandrasekaran *et al.*, 2017; Cheng *et al.*, 2020; Norman, Haß and Pirlich, 2021; Sakthivadivel, Gaur and Geetha, 2023).

Patients who are malnourished or at risk of malnutrition should be examined by a professional nutritionist or other nutrition specialist to receive counseling and therapy and provide additional food if necessary to improve nutritional status, including increasing body weight and muscle mass. Given the association between body weight and clinical outcomes, dietary optimization should also be undertaken in individuals with a normal BMI to mitigate weight loss during TB. Increased food intake and medical nutrition are prescribed when food intake is insufficient to meet nutritional goals through oral dietary supplements and enteral or parenteral nutrition as indicated (Ter Beek *et al.*, 2021; Ma *et al.*, 2022; Ockenga *et al.*, 2023).

Malnutrition screening and systematic assessment of nutritional status should be carried out at diagnosis and regularly (every four weeks) during TB treatment, with high priority given to patient groups potentially at high risk of malnutrition. If necessary, a systematic nutritional assessment should include a nutritionally oriented history and examination as well as anthropometric, dietary, and laboratory assessments (Ter Beek *et al.*, 2021; Ma *et al.*, 2022; Ockenga *et al.*, 2023).

Patients with overweight and obesity accompanied by catabolic diseases such as pulmonary TB can lose >20% of their body weight and muscle mass within 3–6 months and still show BMI values at or above the normal range. Disease-related malnutrition is a (sub)acute condition where a decrease in body weight and muscle/fat-free mass does not automatically result in a low BMI. In contrast, a reduction in body weight and fat-free mass is associated with poor clinical outcomes, including increased morbidity and mortality. BMI assessment is the most used method in clinical practice because WHO recommends BMI to assess malnutrition/malnutrition (Ter Beek *et al.*, 2021; Ma *et al.*, 2022; Ockenga *et al.*, 2023).

Changes in body weight (BW) of pulmonary TB patients increased after treatment. This is because giving food supplements at the beginning of the TB treatment phase can contribute to the patient's weight. Gradual weight gain indicates treatment success and patient progress during TB treatment. Nutritional interventions and support must be prioritized to address the burden of malnutrition effectively (Sabiti, Febrinasari and Aulia, 2021; Ma *et al.*, 2022; Nursyfah and Muflihah, 2023; Wagnew *et al.*, 2024).

Increased weight can also be caused by the consumption of TB drugs, which affect nutritional conditions so that the intake and use of nutrients are fully processed. Apart from TB treatment, adequate energy and protein are also needed to support the healing process and improve the nutritional status of adult pulmonary TB sufferers (Sabiti, Febrinasari and Aulia, 2021; Ma *et al.*, 2022; Nursyfah and Muflihah, 2023; Wagnew *et al.*, 2024).

https://doi.org/10.33086/jhs.v17.i01.5603

This treatment can maximize the body's protective mechanisms by minimizing bacteria. In this study, BW increased significantly during the intensive stage of pulmonary TB treatment. Changes in body weight during the treatment period can be a parameter that the patient has recovered and completed tuberculosis treatment because changes in body weight contribute to the success of tuberculosis treatment by influencing changes in the nutritional status of tuberculosis patients (Sabiti, Febrinasari and Aulia, 2021; Ma *et al.*, 2022; Nursyfah and Muflihah, 2023).

CONCLUSION

At productive age, there were high cases of pulmonary TB, especially at the age of 17-25 years, totaling 18 cases. Males with pulmonary TB were the most common cases, reaching 60 cases out of 85 study samples. The characteristics of the risk of malnutrition in pulmonary TB patients based on the Malnutrition Universal Screening Tools (MUST) found a high risk of malnutrition at the age of > 60 years with a mean of 2.60, which means that on average these patients have a MUST score of 3 (high risk). In this study, 48 cases were found to have a high risk of malnutrition. Still, most patients experienced a significant increase in body weight (BB) in the intensive stage of Pulmonary TB treatment. In the first month, there were 70 cases, and in the second month, there were 66 cases that experienced an increase in body weight. Changes in body weight contribute to the success of TB treatment by influencing changes in the nutritional status of TB patients.

REFERENCES

Agustian, M.D. and Masria, S. (2022) 'Hubungan Usia, Jenis Kelamin dan Tingkat Pendidikan dengan Kejadian TB Paru di Wilayah Kerja Puskesmas Cibadak Kabupaten Sukabumi', in *Bandung Conference Series: Medical Science*, pp. 1120–1125.

Bagcchi, S. (2023) 'WHO's global tuberculosis report 2022', *The Lancet Microbe*, 4(1), p. e20.

Ter Beek, L. *et al.* (2021) 'Malnutrition assessment methods in adult patients with tuberculosis: a systematic review', *BMJ open*, 11(12), p. e049777.

Chandrasekaran, P. *et al.* (2017) 'Malnutrition: modulator of immune responses in tuberculosis', *Frontiers in immunology*, 8, p. 262869.

Cheng, J. *et al.* (2020) 'Incidence and risk factors of tuberculosis among the elderly population in China: a prospective cohort study', *Infectious Diseases of Poverty*, 9(01), pp. 64–76.

Dabitao, D. *et al.* (2022) 'Sex differences in active pulmonary tuberculosis outcomes in Mali, West Africa', *The American Journal of Tropical Medicine and Hygiene*, 107(2), p. 433.

Dong, Z. *et al.* (2022) 'Age-period-cohort analysis of pulmonary tuberculosis reported incidence, China, 2006-2020', *Infectious Diseases of Poverty*, 11(04), pp. 62–71.

Guo, X. *et al.* (2022) 'Nutrition and clinical manifestations of pulmonary tuberculosis: a cross-sectional study in Shandong province, China', *Asia Pacific Journal of Clinical Nutrition*, 31(1), pp. 41–48.

Indonesia, P.D.P. (2011) 'Pedoman diagnosis dan penatalaksanaan tuberkulosis di Indonesia', *Jakarta: PDPI*, pp. 1–21.

Kemenkes, R.I. (2013) 'Pedoman nasional pelayanan kedokteran tata laksana tuberkulosis', *Jakarta: Kementerian Kesehatan RI* [Preprint].

Kementerian Kesehatan Republik Indonesia (2018) 'Laporan Nasional Riset Kesehatan Dasar', *Kementerian Kesehatan RI*, pp. 1–582.

Ma, J.-J. *et al.* (2022) 'Prevalence and prognostic significance of malnutrition risk in patients with pulmonary tuberculosis: A hospital-based cohort study', *Frontiers in Public Health*, 10, p. 1039661.

Martial, N.T., Mubarik, S. and Yu, C. (2021) 'Long-term trends of tuberculosis incidence and mortality in four central African countries', *Scientific reports*, 11(1), p. 16624.

Norman, K., Haß, U. and Pirlich, M. (2021) 'Malnutrition in older adults—recent advances and remaining challenges', *Nutrients*, 13(8), p. 2764.

Nursyfah, L. and Muflihah, H. (2023) 'Perubahan Berat Badan Selama Pengobatan Tuberkulosis Paru', in *Bandung Conference Series: Medical Science*, pp. 197–201.

Nyarko, R.O. *et al.* (2021) 'Tuberculosis a globalized disease', *Asian Journal of Pharmaceutical Research and Development*, 9(1), pp. 198–201.

Ockenga, J. *et al.* (2023) 'Tuberculosis and malnutrition: The European perspective', *Clinical Nutrition*, 42(4), pp. 486–492.

Sabiti, F.B., Febrinasari, N. and Aulia, I. (2021) 'Kepatuhan penggunaan obat anti tuberkulosis fase intensif terhadap perubahan nilai sputum BTA dan berat badan di Puskesmas Bandarharjo Semarang', *Borneo Journal of Pharmascientech*, 5(1), pp. 31–38.

Sakthivadivel, V., Gaur, A. and Geetha, J. (2023) 'Tuberculosis in elderly population: A cross-sectional comparative study', *The International Journal of Mycobacteriology*, 12(1), pp. 38–42.

Thamaria, N. (2017) 'Bahan Ajar Gizi Penilaian Status Gizi', *Kementerian Kesehatan Republik Indonesia* [Preprint].

Wagnew, F. *et al.* (2024) 'Impacts of body weight change on treatment outcomes in patients with multidrug-resistant tuberculosis in Northwest Ethiopia', *Scientific Reports*, 14(1), p. 508.