

E-Proceeding
**INTERNATIONAL CONFERENCE
STIKES ELISABETH SEMARANG**

Theme:
***CARING, INNOVATION AND
SUSTAINABILITY IN HEALTH CARE
FOR SOCIETY 5.0***



Semarang, 23-24 June 2023
Venue : STIKes Elisabeth Semarang
Jl. Kawi No. 11, Wonotingal
Candisari, Semarang 50232 Indonesia

Publisher:
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'CARING, INNOVATION AND SUSTAINABILITY IN HEALTH CARE FOR SOCIETY 5.0'

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RUNDOWN OF INTERNATIONAL CONFERENCE

Friday, 23 June 2023 (webinar)

Indonesia Time (WIB)	Agenda
07.30-08.00	Preparation of the Committee
08.00-08.30	Zoom opening for participants and Pre-opening: Showing a video profile of the STIKes St. Elisabeth, continued opening by MC.
08.30-08.35	1. Opening prayer by Master of Ceremony
08.35-08.40	2. Reading the schedule and rules for participants as online participants by master of ceremony
08.40-08.45	3. Singing Indonesian National Anthem "Indonesia Raya"
08.45-08.50	4. Singing Mars dan Hymne STIKes St Elisabeth.
08.50-08.55	5. Opening Mark by the Chairman of STIKes St. Elisabeth, Sr. Emirensiana Anu Nono, OSF, MAN
08.55-09.00	6. Reading of Introduction to the 1 st moderator by Master of Ceremony
a. 09.00-09.05 b. 09.05-09.40 c. 09.40-10.15 d. 10.15-10.50 e. 10.50-11.25 f. 11.25-11.40 g. 11.40-11.55 h. 11.55-12.00	7. Material of the 1 st session lead by moderator (Nursing) a. Reading the rules of material session, discussion and presence link for online participants by Moderator. (CV will be read before each speaker presenting his material) b. Material by the 1 st speaker (USA) c. Material by the 2 nd speaker (Filippine) d. Material was by the 3 rd speaker (Indonesia) e. Material by the 4 th speaker (Australia) f. Discussion [the 1 st session] g. Discussion [the 2 nd session] h. Photo session and certificate of appreciation
a. 12.00-12.05 b. 12.05-12.40 c. 12.40-13.00 d. 13.00-13.35 e. 13.35-13.50 f. 13.50-13.55	8. Material of the 2 nd session lead by moderator (Nutrition) a. Preparation to the 2 nd session. Reading the rules of material session, discussion and presence link for online participants by Moderator. (CV will be read before each speaker presenting his material) b. Material by the 1 st speaker (online from Mekkah) c. Discussion [the 1 st session] d. Material by the 2 nd speaker (online from Indonesia) e. Discussion [the 2 nd session] f. Photo session and certificate of appreciation
13.55-13.57	9. Conclusion and acknowledgment
13.57-14.00	10. Closing prayer
14.00	End of the webinar and Announcement for oral presentation

Saturday, 24 June 2023 (Paralel Breakout Room Session)

Indonesia Time (WIB)	Agenda
07.30-08.00	Preparation of the Committee
08.00-08.30	Zoom opening for participants and Pre-opening: Showing a video profile of the STIKes St. Elisabeth, continued opening by MC.
08.30-08.35	1. Opening prayer by Master of Ceremony
08.35-08.45	2. Reading the schedules and rules for participants as online participants by master of ceremony
08.45-09.00	3. Positioning the presenters and participants to break rooms
09.00-09.05	4. Oral Presentation in 4 groups lead by each moderator
09.05-10.05	5. Oral Presentation ((Each presenter has 7 minutes for presentation and 8 minutes for discussion)
10.05-10.10	6. Return to main room
10.10-10.25	7. Closing ceremony a. Announcement of the best presenter for each room b. Acknowledgment by the Chairperson of STIKes St. Elisabeth
10.25-10.30	8. Closing prayer
10.30	End of oral presentation



SPEECH

INTERNATIONAL CONFERENCE

STIKES ELISABETH SEMARANG

Good morning and great day to all of the participants in International conferences. It is really nice to meet all of you both online and offline. Well here in our country and also out of the country. I hope all of you are in God's protection and healthy.

The honorable all of the speakers,

1. Mrs. Rosalinda Parado Salistioano, Ph.D., MAN, RN, RM, special professorial Lecturer, and Research Adviser, come from Arellano University Graduate School in the Philippines
2. Dr. Gabrielle McCallum, Senior Research fellow, child Health Respiratory Program Menzies School of Health Research, come from Australia
3. Mr. Prof . Dr. Ir Ahmad Sulaeman, MS , Lecturer , fakultas Ekology manusia Institut Pertanian , Bogor (IPB) come from Bogor West Java, Indonesia
4. Mr. Adriyan Pramono , S, Gz., M. Si., Ph. D, Lecturer Researcher in Nutrition Department Medical Faculty Diponegoro, come From Semarang Central Java, Indonesia
5. Mrs. Ammie Rose C. Agubuya Gates MSN, RN, CNOR, Operating Room Nurse, Speliacity in Hepotobilliaryi Kidney and Liver Transplant Stanford Health Care, Palo, Alto, CA, USA, Come from America.
6. Ms. Eka Wahyuningrum Skep, Ns, M.Kep our Lecturer from STIKes Elisabeth Semarang, Central Java Indonesia.

And also all of the participant's International conferences wherever you are.

Ladies and Gentlemen, I would like to invite all of you to give thanks to God, because of God's providence, we are meeting at this International conference. This seminar is the one of 15th-anniversary (Third of Lustrum) events of Stikes Elisabeth Semarang.

So I would like to say thank you very much to all the participants International conference who have responded to our invitation. I believe all the titles of these international conferences are very interesting for both the nursing and nutrition fields, so I hope all the participants follow the International conference from the beginning until the end because we will be enriched with our knowledge from all the speakers both from abroad and within the country.

Ladies and Gentlemen, This international conference's activity can be carried out well, because of the good cooperation from the International conference's committee in Stikes Elisabeth Semarang. Also the prayers and support from various people and sponsors. So thank you all of you, God will repay all of your kindness.

GOD BLESS US

Semarang, 23 June 2023

Sr. Emirensiana Anu Nono, OSF, MAN
Chairperson of STIKes Elisabeth Semarang

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EARTHING METHOD PREVENTS DIARRHEA AMONG PREMATURE INFANTS IN SUKOHARJO REGENCY, CENTRAL JAVA, INDONESIA

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ABSTRACT

Background: The leading causes of death in premature infants are pneumonia (36%), acute respiratory infection (13%), and diarrhea (10%), which are caused by pathogen infections that indicate a compromised immune system. The earthing/grounding mechanisms increase the immune system by improving the vagal nerve tone, supporting the autonomic nervous system, and regulating important organs in the body, especially the digestive system. Earthing gives benefits for premature infants but the practices in the community is very rare. **Purpose:** The study aimed to analyze the effect of earthing method on the incidence of diarrhea among premature infants. This quasi-experimental research was conducted in Sukoharjo district, Indonesia, from March to August 2021. The population taken from the Data Statistic Center Agency in Central Java was 192 premature infants; the sample size was 20. Intervention earthing 1 hour/day for 30 days. **Result:** Statistical analysis with paired t-test resulted in a P value of $0.008 < 0.05$ & a t-count value of $2.990 > t$ table of 1.734, indicating H_0 was rejected and H_a was accepted, or there was a difference in the length of diarrhea incidence of infants experiencing diarrhea before and after being given the intervention. **Conclusion:** Continuously applying the Earthing method is recommended to increase immunity and prevent diarrhea by a device or direct contact.

Key words: diarrhea; earthing; grounding; immunity; premature

INTRODUCTION

Premature infants are vulnerable and experience compromised immune systems, which increases the risk of infection, inflammation, and complications, especially during 12 months of age (Simon et al. 2015). Earthing researchers and pediatricians from Pennsylvania State University Children's Hospital Neonatal Intensive Care Unit in Hershey employ Earthing for preterm infants' treatment for two months. The study shows positive results in clinically stable infants, improved heart rate variability (HRV), and normalized nerve vagal function (Passi et al. 2017).

Preterm delivery contributed to the leading cause of 60-80% of neonatal morbidity and mortality worldwide. The incidence of preterm birth in Indonesia was 15%, a leading cause of neonatal death in the country. Diarrhea is the third major cause of neonatal death among preterm infants after pneumonia and acute respiratory infection (WHO 2020).

Premature infants have immature immune systems, including the white blood cells component such as low neutrophil, NK cell dysfunction, relative hypogammaglobulinemia, and T cell lymphopenia (Dirix et al. 2013; Misra et al. 2015; Mukhopadhyay et al. 2014; Sampah et al. 2020). Preterm infants suffer from compromised immune systems because they lose some or all of the third trimester, which antibodies transferred from the mother (Niewiesk 2014), resulting in a high risk of infection, inflammation, and complication.

As defined by WHO, diarrhea is a condition of passing three or more loose stools or liquid stools per day or more frequently than infants' stool elimination habit. It is divided into acute or chronic based on the duration of the symptoms. Acute is when the symptoms are in less than 2 weeks, while chronic is when it last 2–4 weeks (WHO 2005; (Bandsma, Sadiq and Bhutta 2019). The mortality rate of premature children with Mild to Severe Diarrhea (MSD) according to age group 0-11 months was 10.9 per 1000 persons-week at risk (PWAR), 12-23 months, was 11.9 per 1000 persons-week at risk, and among 24-59 months was 5.9 per 1000 persons-week at risk (Rivera and Ward 2022).

A more detailed analysis of the age-specific of children with diarrhea found that infants and toddlers could experience malabsorption or persistent intestinal infections, inflammatory bowel disease (Smilie and Gupta 2021), contamination from microbial pathogens in food or water, contact person to person, or fecal-oral transmission. These methods are most often transmission of norovirus and Shigella outbreaks. Diarrhea is also closely related to bad hygiene and poverty (Jeff et al. 2019). Rotavirus infection occurs among infants younger than 24 months old. Moreover, after 24 months, Shigella is the most common cause of diarrhea, followed by Rotavirus like *Staphylococcus aureus*, *Shigella*, and *Clostridium difficile* (Rivera and Ward 2022). These cases need close monitoring and usually require a tertiary health care intervention. A detailed examination is necessary, especially the anamnesis of history, and a thorough physical examination is to define an accurate diagnosis (Smilie and Gupta 2021).

The causes of acute diarrhea among infants 0-11 months are divided into infectious and non-infectious etiologies. Infectious etiology are Rotavirus, norovirus, and adenovirus, which account for up to 90% of diarrheal cases. The second cause is the bacterial pathogens, including *Escherichia coli* and *non-typhoidal Salmonella*, *Shigella*, and *Vibrio parahaemolyticus* (Chen et al. 2018; Posovszky et al. 2020). Bacterial or viral diarrhea cannot be differentiated by clinical examination alone. However, mucose with blood and high fever likely indicate bacterial infection. On the other hand, non-infectious etiology may be a non-specific symptom of the acute surgical abdomen, necrotizing enterocolitis, or intussusception, the use of antibiotics, or alteration of intestinal gut flora (Viegelmann et al. 2021).

The causes of chronic diarrhea are divided by age group. Among infants without the presence of systemic symptoms aged <6 months old, the causes are prolonged bacterial gastroenteritis, post-enteritis syndrome, infections of parasites, food-protein allergies, medication use, chronic constipation with spurious diarrhea (consider Hirschprung's disease); on the other hand, among infants > 6 months, causes are prolonged bacterial gastroenteritis, post-enteritis syndrome, parasitic infections, coeliac disease, medication,

inflammatory bowel disease, functional diarrhea (newly weaned child, and irritable bowel syndrome). While in the case of the presence of systemic symptoms among children < 6 months old, the causes are food allergies, pancreatic insufficiency, immunodeficiency, and neoplastic disease; whereas among aged > 6 months old, the causes are food protein allergies, pancreatic deficiency, and carbohydrate malabsorption, coeliac disease, immunodeficiency, inflammatory bowel disease, and neoplastic disease (Viegelmann et al. 2021).

The presence of co-morbidities increases the risk of neonatal deaths caused by diarrhea as listed from the highest risk to the lowest: malnutrition, pneumonia/lower respiratory infection, or invasive bacterial infection, with the presence of systemic symptoms like lethargy, wrinkled skin, as well as infection of *Cryptosporidium* (Acacio et al. 2019).

A study of close monitoring of 821 cases of premature infants with moderate to severe diarrhea for 60 days resulted in 69 patients dying (case fatality rate was 8%). Among death cases, 33/69 died within two weeks (48%), and 36/69 (52%) died more than two weeks. The increased risk of death was caused by *Escherichia coli* (HR = 4.16, $p = 0.0461$) and *Cryptosporidium* (H = 2.84, $p = 0.0001$). On the contrary, the infection caused by Rotavirus decreased the risk of death (HR = 0.52, $p = 0.0198$) (Acacio et al. 2019).

The pathophysiology varies based on the organism causing diarrhea. *Salmonella* causes increase fluid secretion in the intestines leading to dehydration. Infection of enterotoxin causes noninflammatory disease, while the virus attacks the villus and mucus. Cytotoxins such as *Shigella* and *Clostridium difficile* infection affect susceptible tissue and create inflammation in the interstitial lumen, causing it to release fluid, proteins, and leucocytes. Adenovirus can directly attack microvillus causing the inability of the intestines to absorb (Rivera-Dominguez G, 2023).

In the process of diarrhea on a molecular level, the agents invade the interstitial lumen by activation of enterocyte signal transduction, inducing the cytoskeleton of the host cells to alter the water and electrolyte fluxes across the enterocytes. In toxic diarrhea, there is inhibition of NaCl absorption because of the increasing cAMP. Histologic damage in the villus reduces glucose absorption and neutralizes NaCl absorption, and stimulates sodium (Rivera and Ward 2022).

The key management for diarrhea is hydration. The outcomes depend on the severity and time of treatment. Delayed treatment leads to multiorgan failure that leads to death. There are limited options for treating gastroenteritis, but there are more methods to improve the immune system and prevent diarrhea, by exclusive breastfeeding for the first 6 months of life and vitamin A supplementation that prevents death caused by diarrhea by up to 30%. Another way is to improve cleanliness in the environment, food, and water and administer the rotavirus vaccine. (Freedman et al. 2018).

The health care treatments needed by preterm infants in the NICU require high cost and intensive care financed by the Social Health Insurance Administration Agency in Indonesia (Setyawan, 2015). Preterm infants also need intensive care at home in the community after hospital admission, which requires a maintained body temperature provided by the incubator, a clean environment, adequate exclusive breastfeeding during 6 months, and prevention from exposure to pathogenic microorganisms. These home treatments depend on the ability of mothers or caregivers to provide quality care at home.

Mothers with a family history or previous delivery of prematurity have a high risk of recurrent premature delivery. Those mothers may have prior knowledge and experience in caring for their infants. In contrast, mothers or families who are first time having preterm infants will have a problem caring for them because of inadequate information or inexperience, leading to low quality of care and increased risk of infection. There is an urgent need for premature infant care in the community to boost the immune system with low cost, easy access, practical, and safe such as Earthing.

Earthing supplies electrons into the body by direct contact between the skin and the soil. The benefit of Earthing is to improve the function of the autonomic nervous system from the sympathetic and parasympathetic nervous system, increases heart rate variability, normalizes the hormone cortisol (Menigoz et al. 2020), and improves vagal nerve function, which normalizes the digestive system and heart rate variability, (Passi et al. 2017).

In addition, another study is on the benefit of reducing inflammation because 1) inflammation caused by free radicals in the body is neutralized by an abundant supply of electrons from the earth. and 2) stress hormone or cortisol is normalized, resulting in a balanced function of cardiovascular, digestion, and other systems. The benefit of Earthing is to prevent chronic infection, inflammation, and autoimmune disease (Oschman, Chevalier, and Brown 2015).



Picture source: <https://www.psu.edu/news/research/story/electrical-grounding-technique-may-improve-health-outcomes-nicu-babies/>

Figure 1. Installation of grounding on the infant's feet in the NICU

A previous interview with 10 mothers who cared for preterm infants at home with an incubator stated that they had no information about Earthing therapy. A continued interview was done with 10 mothers who cared for preterm infants at home with an incubator, but no one knew about Earthing therapy. A continued discussion was held with eight mothers with mature-born toddlers; they explained that their children were less likely to be sick or admitted to the hospital after accidentally applying Earthing (by playing barefoot on the soil). The children showed to be having stronger immune systems and stabilized moods. Due to the fact that more benefits come from Earthing, it is significant to conduct a study investigating the effect of Earthing in the pediatric field.

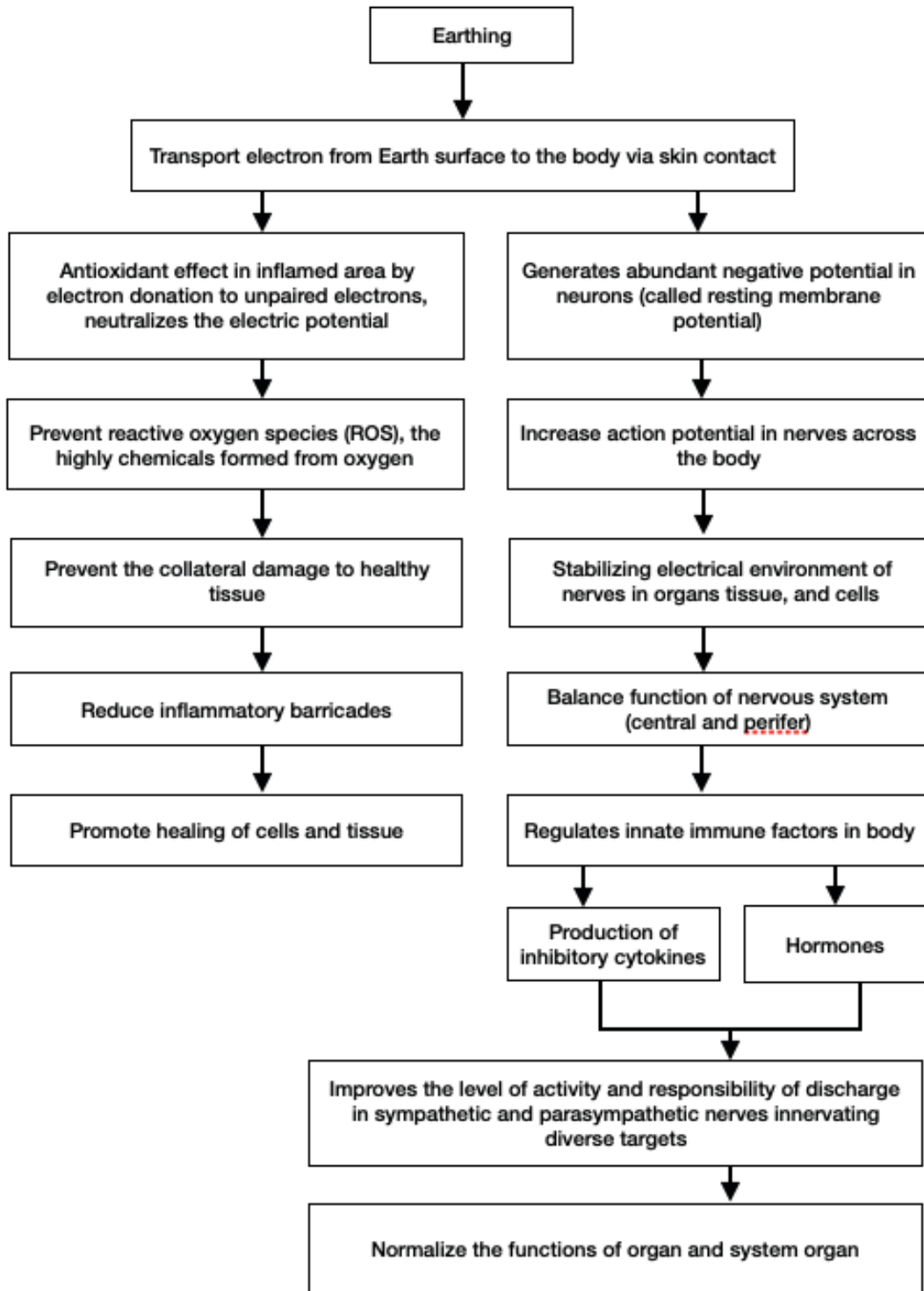


Figure 2. Mechanism of Action of Earthing to improve immune system among Preterm Infants

METHOD

The research was a quasi-experimental study conducted in Sukoharjo Regency from March to August 2021. The population was preterm infants total of 192 (as reported by the Statistic Center Agency, Central Java, and 20 preterm infants were recruited to be the sample by purposive sampling (BPS 2021). The sample size was calculated using a formula for experimental study (Supranto 2000):

$$(t - 1) (r - 1) > 15$$

Where :

t = number of treatment groups;

r = number of replications

With the t = 1 group,

then : $(1 - 1)(r - 1) > 15$ result in $r > 16$.

Inclusion Criteria: (1) Born between 32 and 37 weeks of gestational age, (2) 0-12 months of age, (3) without congenital abnormalities, (4) The infants were being cared for at home.

Exclusion Criteria: parents did not consent to participate in the study.

Furthermore, the Earthing device is made with a copper rod, copper wire, and copper mesh. The device is installed by planting the rod in the yard, with the copper mesh on the infant's bed; then the wire goes through by the window. The preterm infant lays on the mesh with the bare feet touching the mesh during nap time for 1 hour.

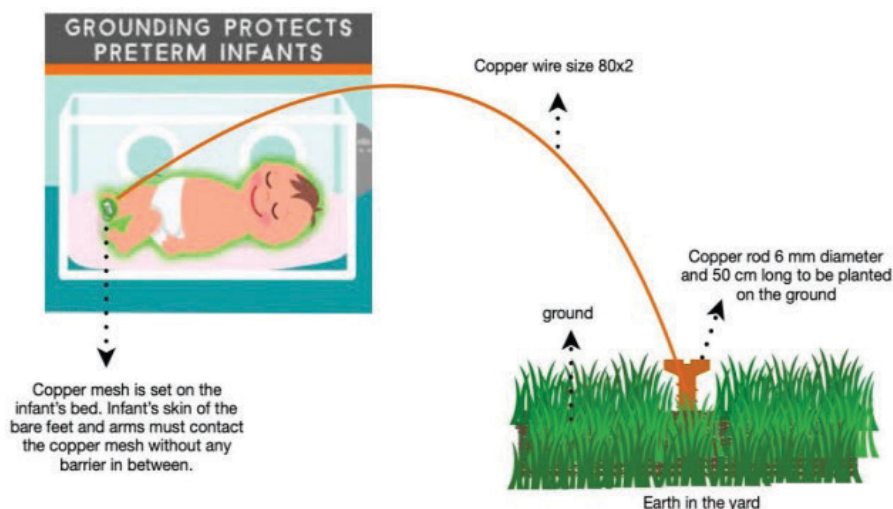


Figure 2. Installation of Earthing Device at Home

There were two stages that were done: the control without intervention for 30 days and the intervention of Earthing for 30 days. The data were obtained three times: the initial meeting at home, the 30 days after the controlled stage, and the 30 days after the intervention. The infants were monitored during the first week of Earthing therapy by home visit, then continued online through the phone.

The studies suggest that Earthing is safe and natural. However, the researchers closely monitored the health and well-being of the respondents. The referral was planned as anticipation if there is an emergency condition such as the infant not wanting to breastfeed, being restless, having difficulty breathing, or having a fever with a temperature $>37.5^{\circ}\text{C}$.

The Earthing concept was constructed and tested together with Ph.D. in Engineering from the Faculty of Mechanical and Industrial Engineering, Universitas Gadjah Mada, consisting of 400-density copper mesh, 2x80 copper cables, and copper stakes planted in the ground with a diameter of 10mm and a length of 60cm. The instrument in the form of a questionnaire contains the socio-demographic characteristics of the mothers and infants, including age, parity, level of education, occupation, socioeconomic factors, infants' date of birth, birth weight, and diarrhea occurrence.

The research team carried out the tool assembly process to create a safer, more comfortable, and more durable device design for infants:



Figure 3. In an experiment measuring skin voltage when not grounded/not Earthing, a skin voltage of 274.8 millivolts



Figure 4. Experimental measurement of skin voltage when grounded/do Earthing, skin voltage 0.00 millivolts



Figure 5. Final stage trial/Finishing



Figure 6. The result of reading the skin voltage after Earthing is 3.9 millivolts which means the tool is functioning optimally.

This research is very significant and provides value for self-sufficiency and community empowerment by prioritizing the use of existing and sustainable natural resources. In the research process, respondents received close monitoring of their health and well-being. If there is an emergency, the researcher will immediately carry out an examination and referral to a hospital that is collaborating with the research team. To replace the time and resources that have been given by the respondent, the respondent gets a compensation fee. Researchers guarantee the protection of the subject's privacy with anonymity. Respondents were given an explanation regarding the objectives, benefits, interventions, side effects before making a decision to participate in this study.

In preparing the Earthing tool, together with the Ph.D Engineering research team from Tokyo University who also have careers at Gajah Mada University. Earthing system is adapted from CBM Technology (company), IEC (International Electrotechnical Commission), BS-EN (British Standards European Norm) and IEEE (Institute of Electrical and Electronics Engineers) standards.

This research has received support from the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia as well as permission from the Health Office of

Sukoharjo Regency, Central Java and from Community Health Centers under the authority of the Health Office of Sukoharjo Regency, Central Java.

RESULT

Respondents lived in a rural area with less dense housing. Some of them have expansive open access soil uncovered by the cement or pavements in the back or front yard, making planting copper rods easy. At the same time, the mat was put in the infant's bedroom, while other families had limited open access to the soil in the surrounding. Below is the characteristic of mothers and preterm infants.

Table 1. Socio-demographic variables of mothers and preterm infants

Respondents	Socio-demographic variables	Frequency	%
Mothers	Age		
	20-35 years old	8	32
	>35 years old	12	68
	Level of Education		
	High School Graduate	15	75
	Higher Education Graduates	5	25
	Parity		
	Primipara	7	35
	Multipara	13	65
	Etiology of Premature Delivery		
	Premature rupture of membrane	7	35
	Preeclampsia	4	20
	Antepartum hemorrhage	2	10
	History of preterm delivery	4	20
Anemia	3	15	
Infants	Age		
	0-6 months	10	50
	6-12 months	10	50
	Sex		
	Male	8	32
	Female	12	68
	Gestational Age		
	Late Preterm 34 to <36 weeks of gestation	11	55
	Early Preterm 32 to <34 weeks of gestation	9	45
	Infant's weight at birth		
1500 to <2000 gr	8	40	
2000 to <2500 gr	12	60	
Total sample	20	100	

Table 1 indicates the majority of mothers were aged more than 35 years old (12 or 68%), graduated from high school (15 or 75%), and were multiparous (13 or 65%). The etiologies of preterm delivery were mostly premature rupture of membrane (7 or 35%), followed by preeclampsia (4 or 20%), history of preterm delivery (4 or 20%), anemia (3 or 15%), and antepartum hemorrhage (2 or 10%). Infants aged less than 6 months and more than 6 months were both equal (10 or 50%), the majority were female (12 or 60%), born between 34-<36 weeks of gestation (11 or 55), weighed 2000 to <2500 grams (12 or 60%).

Table 2. *The incidence of Diarrhea Among Infants Before and After Earthing therapy*

Infants	Frequency of Infants Suffered from Diarrhea		Total days of diarrhea		Sig. (2-tailed)	Paired sample test (t-test)	t table at df 18
	Before Earthing	After Earthing	Before Earthing	After Earthing			
20 infants aged 0-12 months	8 infants	0 infant	20 days	0 days	0,008	2.990	1.734
Mean			0.8 day	0 day			

This study’s control process was 30 days before Earthing intervention and 30 days after Earthing intervention. The infants were observed for their health and well-being during home visits. Mothers were interviewed on the occurrence of diarrhea and the following symptoms such as fever or lethargy. The study result, before Earthing, eight infants suffered from diarrhea (around 1-3 days) with total days of diarrhea of 20 days (mean 0.8 days). After Earthing, no infants suffered from diarrhea. The paired t-test analysis showed a result of P-value $0.008 < 0.05$ and t-count $2.990 > t\text{-table } 1.734$. It indicates a significant difference in the length of occurrence of diarrhea before and after Earthing therapy.

DISCUSSION

The majority of mothers aged >35 years old (12 or 68%) indicate a period with a high pregnancy risk. Mothers mostly graduated high school (15 or 75%), which implied mothers could not access higher education. This situation reflects mothers’ ability to access and process new information about pregnancy and self-care during risky maternal age. Mothers with higher education can think critically about prevention or fast response to a condition that needs more concern to prevent preterm delivery. Most mothers were multiparous (13 or 65%), which indicates the mothers had previous knowledge and experience in caring for premature infants. The leading cause of premature delivery in this study was premature rupture of membrane (7 or 35%), followed by the same number of cases of preeclampsia and history of premature delivery (4 or 20%), then anemia (3 or 15%) and antepartum hemorrhage (2 or 10%).

Premature rupture of membrane (PROM) is a spontaneous rupture of the amniotic membrane at less than 37 weeks or until 1 hour before a contraction begins. The etiology of PROM is unknown, but in most cases, an intrauterine infection is a precursor (Goldenberg et al. 2008). Studies show that preterm delivery results from multiple mechanisms such as infection/inflammation, ischemia or antepartum hemorrhage, overdilatation of the uterus, higher stress levels, or other immunology-related problems (Romero et al. 2006). A precise

etiology is unidentified. Therefore, the mechanism can only be explained through multiple risk factors of preterm birth that relate to the onset of infection/inflammation (Goldenberg et al. 2005).

The factor of history of preterm delivery is not confirmed. However, in this study, mothers with a history of preterm delivery had low lower body mass index of 18.5-20, which might relate to unbalanced nutrition or could cause overdistension of the uterus. Anemia is also confirmed to correlate significantly with preterm birth by 1.56 times higher (Rahmati et al. 2020). Other respondents confirmed that she had preeclampsia began around 2-6 months of pregnancy. Davies et al. (2016) found that preeclampsia increases the risk of preterm delivery by 4.43 times higher. The 2 cases of preterm delivery were accompanied by antepartum hemorrhage. Klinger et. Al (2021), a cohort study on a population, stated that antepartum hemorrhage induced 32.3 % or almost one-third of preterm delivery.

The number of infants aged 0-6 months was equal to aged 6-12 months (10 or 50%); most were female (12 or 60%), born later preterm 34 to <36 weeks of gestation, and weighed 2000 to <2500 grams. Infants born late preterm have better outcomes than early preterm 23 to <34 weeks because the organs develop more than in early preterm. The more time fetus has in the uterus during the third trimester of gestation helps to acquire more maternal immunoglobulin to help strengthen the immune system. Infants weight 2000 to <2500 grams are grouped in the low birth weight. It gives the infant more advantages and indicates that body organs develop more than those in very low birth weight or between 1500 to <2000 grams. Villanova et al. (2019) compared the prognosis of birth weight and state that the lower the birth weight, the lower chance of survival.

The condition of the respondents house are kept clean. The sheets for the infants bed looked clean; according to the explanation from the parents, the sheets were changed regularly, as well as the hygiene of the infants clothes. Infants who have diarrhea often seem to put their fingers in their mouths after holding toys on the bed, and their mothers didn't seem to pay attention to the cleanliness of their infants hands. The infants looks active playing, and the need for breast or complementary milk is not disturbed. The infants mother did not bring her infants to a hospital because, according to the mother, the infants did not experience a fever, was active, still breastfeeding, and had a good sleep pattern as usual. Mothers also believe that if the infants have diarrhea, it is in the process of cleaning the digestive tract to develop their abilities, like the ability to crawl, walk or talk. Based on the mother's explanation, the stool that came out was more liquid; the frequency was around 4-6 times a day, and there was no pus, blood, or foul smell. From these symptoms, it appears that bacteria do not cause the possibility of diarrhea.

Among first-time mothers, their mothers (grandmothers of the infants) helped the mothers to care for the infants by maintaining the infants' temperature, adequate nutrition, facilitating playful time, and quality rest. Support from the mothers seemed to have improved maternal ability to prevent stress and psychological burden.

After Earthing intervention, there is a significant improvement in the infant's immune system; it prevents them from having diarrhea. Earthing supplies abundant electrons from the soil into the infants' bodies through the skin, providing an antioxidant effect to counter free radicals, prevent inflammation and infection, balancing the nervous system with the negatively charged electrons as transmission information in the body. As electron transmits in the body creates an antioxidant microenvironment in the inflamed tissue, slows down or inhibits the reactive oxygen species that result in collateral damage to healthy tissue, and prevents the formation of "inflammatory barricades." (Passi et al. 2017).

Earthing therapy improves infants' clinical condition by enhancing the rate of variability, which indicates a responsive autonomous nervous system adapting to the external surroundings to strengthen the function of the heart rate, blood pressure, breathing, and digestion system as a mechanism. The nervous vagal extends from the autonomous nervous system on the brainstem to the abdomen to primarily regulate the vital organs, such as the heart, lungs, and digestive system (Passi et al. 2017).

Increased vagal nerve tones indicate an effective function of the autonomic nervous system that regulates involuntary vital organs such as the heart, lungs, and digestive system. According to Dr. Palmer, this improvement in health indicators can prevent inflammation and disorders in vital body organs due to incomplete nervous system maturation, such as term infants who lack immunoglobulins. Among infants in the NICU, Earthing significantly benefits infants by lowering the high skin voltage caused by environmental radiation such as incubators or medical devices by 99% until close to 0.00mV. High skin voltage creates a stress response from the nervous system. The Pediatricians from Penn State found that Earthing reduced skin voltage to affect the reduced stress in the nervous system and normalized cortisol hormone in the body (Passi et al. 2017).

In addition, in this study, Earthing was applied at home, but infants still experienced electricity radiation from home appliances. During the experiment at home on the Earthing device, the measurement of skin voltage at home showed 274.8 mV; it can be reduced drastically to 0.000 and fluctuates until 3.9 mV in 3-5 seconds.

Moreover, the doctors in the ICU Department at Penn State have investigated the effect of Earthing as a defense mechanism against infection, inflammation and to prevent deaths. Premature infants' immune systems can also be enhanced to match the immune system function of term infants. Purwandari (2020), in a study of preterm infants in Indonesia, found that immune system improvement at home depends on environmental hygiene and quality care after birth (Purwandari, 2020).

CONCLUSION AND RECOMMENDATION

Conclusion

The earthing intervention has significantly prevented the occurrence of diarrhea among preterm infants with P-value $0.008 < 0.05$ and t-count $2.990 > t\text{-table } 1.734$. This indicates that there is significant difference on the occurrence of diarrhea before and after earthing.

Recommendation

It is highly recommended that mothers can continue to apply Earthing to infants at home to significantly help improve the immune system and normalize the function of the nervous system that further regulates the optimal function of the vital organs such as the heart, lungs, and digestive system. Healthy function of the body organs, especially the digestive system, would significantly support growth and development. At home, Earthing can be done with a device or direct contact with the soil.

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DETERMINANT FACTORS OF NEWBORN WITH LOW BIRTH WEIGHT (LBW) IN KEDUNGKANDANG DISTRICT MALANG CITY

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ABSTRACT

Background: The main causes of neonatal death are birth complications of LBW (16%), intrapartum-related complications (11%), sepsis (7%), congenital anomaly (5%), pneumonia (3%), and tetanus (1%). The incidence of LBW is influenced by three factors, including maternal, fetal, and placenta factors. In East Java Province, especially in Malang City, the highest LBW incidence in the period of three years from 2015 to 2018 occurred in Kedungkandang District respectively 366 cases. research in Kedung Kandang, specifically in an area as a whole which looks at the characteristics of the mother and baby, history of obstetric status, nutritional status of the mother, environmental conditions, mother's behaviour in providing antenatal care to family income. **Purpose:** The study was conducted to describe the factors of newborns with LBW in Kedungkandang District Malang City. **Method:** The method in this study used a descriptive quantitative design. The population was mothers who had a history of giving birth to babies with Low Birth Weight (LBW) in the past 3 years from 2018 to 2020 in Kedungkandang District with a sample of 40 respondents. This study used primary data sources in the form of questionnaires and secondary data in the form of Maternal and Child Health (KIA) books. **Result:** Based on the results of the study there are 14 factors that influence the incidence of LBW both from the mother such as gestational age at birth, gestational distance, parity, increase in maternal weight and size of LILA, gestational age at birth, interval of pregnancies, parity, increase in maternal weight and size of LILA, factors originating from the fetus such as gender, baby's weight and birth order, environmental factors, namely the husband who smokes and finally the number of antenatal care visits made by the mother. **Conclusion:** The study concluded there are 14 factors that influence the incidence of LBW in Kedung Kandang Primary Health Care.

Key words: low birth weight (LBW); maternal factors; newborn;

INTRODUCTION

Through the Republic of Indonesia Minister of Health No. 25 of 2014 concerning child health efforts, the government states that every child has the right to survival, growth, and development, so it is necessary to carry out child health efforts in an integrated, comprehensive, and sustainable manner (Kementerian Kesehatan RI, 2021, p. 116). The infant mortality rate indicates the level of public health problems, such as factors causing infant mortality, quality of antenatal care, nutritional status of pregnant women, success rate of implementation of the Maternal and Child Health (KIA) and Family Planning (KB) programs, environmental conditions and socioeconomic status (A. Kusumawardani et al., 2018, pp. 175–176).

Globally, infant mortality has decreased since 1990, from a mortality rate of 5.2 million cases to 2.3 million cases in 2021. In 2015 the infant mortality rate in Indonesia decreased from 33,278 cases to 32,007 cases in 2016. The data shows that In 2021, there were 5,102 cases of infant mortality. Even though there has been a significant reduction in infant mortality, newborn mortality is still relatively high when compared to the target of reducing infant mortality rate set in the 2030 SDGs of 24.8 per 1,000 live births (Kementerian PPN/ BAPPENAS, 2017, p. 15).

The most common causes of infant death in 2021 are due to conditions of low birth weight (LBW) of 34.5% and asphyxia of 27.8%, while other causes of death include congenital abnormalities, infection, covid-19, neonatal tetanus (Kemenkes RI, 2022, p. 131). A baby is said to be LBW if it has a birth weight \leq 2500 grams (Hartiningrum & Fitriyah, 2019, p. 97). The baby's birth weight is the baby's first weight obtained after the baby is born and weighed early in life before a significant decrease in the baby's weight after delivery. It is important to measure the baby's birth weight in order to determine whether the baby's health status is vulnerable or not (Lake & Olana Fite, 2019, p. 5).

Babies born with LBW tend to be susceptible to various diseases and are associated with a series of short and long-term consequences (UNICEF & WHO, 2019, p. 6). Such as a greater risk of death and disability, impaired growth, and decreased cognitive function, language, and motor development (Lake & Olana Fite, 2019, p. 2), And suffer from diseases such as heart disease, hypertension, and diabetes mellitus in adulthood (Hussain et al., 2018, p. 850).

Globally, more than 20 million births are recorded worldwide, 15.5% are LBW, and 95.6% of all babies with LBW are born in developing countries (Singh et al., 2017, p. 8). The prevalence of LBW in South Asia is the highest in the world, namely 26.4%, while in Africa, it is 13.4%; in Southeast Asia, it is 12.3%, and 5.1% in East Asia, Low birth weight in the Southeast Asia region. Indonesia, in particular, is below the Southeast Asian low birth weight incidence rate of 10% (UNICEF & WHO, 2019, p. 11). However, this figure is still relatively high from the LBW target set by the Nutrition Improvement Towards Healthy Indonesia Program target of 7% (Hafid et al., 2018, p. 2).

East Java Province consists of 9 cities, one of which has the second highest prevalence of LBW, namely Malang City (Dinkes Jatim, 2021, p. 79). According to data obtained from the Malang City Health Profile in 2017, there were 564 cases of LBW out of 12,098 live births, while in 2018, there was a decrease of 541 LBW cases out of 12,008 live births (Dinas Kesehatan Kota Malang, 2019, p. 17). The highest LBW incidence in Malang City within a period of 3 years from 2015-2018, occurred in the working area of the Kedungkandang

District Health Center, and the lowest was in the working area of the Klojen District Health Center, namely 366 cases and 290 LBW cases respectively (Dinas Kesehatan Kota Malang, 2019, p. 17).

The results of the 2018 Riskesdas data show that the highest prevalence of LBW in Indonesia occurs in Central Sulawesi Province (8.9%), and the lowest is in Jambi (2.6%), while East Java Province ranks eleventh highest after South Sumatra with an incidence rate of LBW around 6.6 % (RI, 2019, p. 426). The results of Hartiningrum's 2018 study, which analyzed trends in the incidence of LBW in East Java province, showed that the incidence of LBW during the last five years has fluctuated, where it decreased significantly in 2014 (3.3%) to (0.3%) in 2015. Then in 2016, there was a very significant increase of (3.6%) (Hartiningrum & Fitriyah, 2019, p. 99).

Several factors influence the incidence of LBW, including maternal, fetal, and placental factors. Maternal factors are divided into two, namely, the mother's characteristics and the mother's behavior. Maternal characteristics that influence the incidence of LBW include maternal age at pregnancy (< 20 years or > 35 years), maternal gestational age, birth spacing, parity, previous history of LBW, socioeconomic conditions, maternal weight gain, maternal complaints, and health. The influence of maternal behavior on the incidence of LBW, including the frequency of prenatal care, consumption of Fe tablets, type of work, frequency of being close to smokers, or smoking habits (Hussain et al., 2018, p. 851). In addition, fetal factors include fetal distress, twin pregnancies, and pregnancies with hydramnios, while the placenta itself is placenta previa and placental abruption (Jumhati & Novianti, 2018, p. 114).

Previous research has indeed found factors related to the incidence of LBW. Still, there has been no research in Kedung Kandang specifically as a whole in an area that looks at the characteristics of the mother and baby, history of obstetric status, nutritional status of the mother, environmental conditions, mother's behaviour in carrying out antenatal care to family income.

The increase in the number of LBW incidents within three years in the working area of the Kedungkandang District Health Center requires appropriate intervention to help reduce the number of LBW incidents. So, this research was carried out to describe the factors in the incidence of LBW babies in the Working Area of the Kedungkandang District Health Center, Malang City.

METHOD

The design used in this study is descriptive quantitative with the type of Cross-Sectional Study using a retrospective approach. This research was conducted from June to August 2020 with a population of mothers with LBW babies born in 2018-2020 in the working area of the Kedungkandang District Health Center, Malang City, including the Gribig Health Center, Kedungkandang Health Center, and Arjowinangun Health Center.

The sampling technique was purposive, with a sample target of 90 respondents. The researcher obtained 249 prospective respondents, while the inclusion criteria were that the mother had an Maternal and Child Health book, the distance where the respondent lived was within the coverage area of the Kedungkandang District Health Center and had been registered at that place, so that the address could be found to be given a questionnaire

regarding the characteristics of the mother and mother's behavior, and willing to become research subjects by signing informed consent. After that, determine the research respondents randomly using a simple random sampling technique, considering that not all mothers who have babies with low birth weight babies can be used as research respondents. Therefore only obtained 40 respondents.

The primary data collection technique uses a questionnaire tested for validity and reliability in the working area of the Arjuno Health Center. The questionnaire contains questions, including the mother's age at pregnancy (<20 years or >35 years), the mother's gestational age, birth spacing, parity, socioeconomic conditions, maternal weight gain, maternal complaints and health, frequency of prenatal care, consumption of Fe tablets, type of work, frequency of being close to smokers or smoking habits. Secondary data was obtained from mother and baby cohort data and Kesehatan Ibu dan Anak (KIA) book, which included the mother's identity, the baby's identity, antenatal care, and records of health services for mothers and new babies born.

The data collected in this study came from primary and secondary data, which were carried out directly to the research respondents. The researcher will explain this in detail, starting from the background and objectives of the methods used in this study. Researchers will also explain the form of involvement of respondents in this study. Furthermore, respondents were asked to read and sign several forms and statements of willingness to involve respondents in this study. The data that has been obtained from filling out the questionnaire will be analyzed using descriptive analysis techniques, namely by categorizing the research data that has been collected and then describing the determinants of the incidence of LBW babies. Research and data collection were carried out after obtaining approval for ethical clearance from the Salatiga Satya Wacana University Ethics Commission with number 264/PE/KEPK.UKSW/2020.

RESULT

The location of research on the incidence of LBW babies was carried out in the working area of the Kedungkandang District Health Center, which includes three Community Health Centers, namely Gribig Health Center, Kedungkandang Health Center, and Arjowinangun Health Center. Access roads to the health center can be reached using public transportation or private vehicles depending on the location of the residence.

The following are the results of the research that have been categorized and presented in the following table:

Table 1. General Characteristics Of Respondents Based on The Mother's Age During Pregnancy, Education, Mother's Occupation, and Family Income

Description	Frequency (n)	Percentage (%)
Maternal age during pregnancy		
At risk (>35 tahun)	9	22,5
Not at risk (20-35 tahun)	31	77,5
Maternal education Level		
Elementary school	11	27,5

Junior high school	9	22,5
Senior high school	16	40
Collage	4	10
Maternal Occupation		
Employee	8	20
Housewife	32	80
Family income		
<500rb	5	12,5
500rb-1.500rb	22	55
1.500rb-2.500rb	13	32,5
>2.500rb	0	0
Total	40	100

Table 1 shows that most of the respondents experienced pregnancy in the non-risk or productive age category, namely 20-35 years, as much as 77.5%. The majority of respondents in the working area of the Kedungkandang District Health Center had a high school education, as much as 40%, and a small number of respondents still had an elementary school education (27.5%). Respondents who gave birth to LBW babies in the work area of the Kedungkandang District Health Center were mostly unemployed mothers (80%), and 55% had a total family income ranging from 500,000-1,500,000.

Table 2. Characteristics of Respondents Based on Gestational Age at Birth, Gestational Distance, Parity, Maternal Weight Gain, and Mid-Upper Arm Circumference (MUAC)

Description	Frequency (n)	Percentage (%)
Gestational weeks		
Preterm (< 37 minggu)	25	62,5
Aterm (37-42 minggu)	15	37,5
Distance between pregnancy		
At risk (<2 tahun dan anak pertama)	15	37,5
Not at risk (\geq 2 tahun)	25	62,5
Maternal's parity		
Primiparous	12	30
Multiparous	28	70
Maternal's weight gain during pregnancy		
Less (<10 kg)	13	32,5
Average (10-16 kg)	22	55
Over weight (> 16 kg)	5	12,5
Mid-Upper Arm Circumference (MUAC)		
At risk (<23,5 cm)	7	17,5
Not at risk (\geq 23,5 cm)	33	82,5
Total	40	100

The highest percentage of gestational age at birth was at preterm gestation (<37 weeks), as much as 62.5%, with the number of parity in the multipara category (70%). Most respondents who gave birth to LBW babies occurred in the non-risk pregnancy spacing group (≥ 2 years) by 62.5%. In contrast, for Mid-Upper Arm Circumference (MUAC), almost all respondents had MUAC in the non-risk category (≥ 23.5 cm) 82.5%.

Table 3. Characteristics of Babies Based on Sex, Baby Weight, and Birth Order

Description	Frequency (n)	Percentage (%)
Baby's gender		
Boy	18	45
Girl	22	55
Baby's birth weight (grams)		
Low birth weight (< 1500)	1	2,5
Very low birth weight (1500-2499)	39	97,5
Birth order-		
1	13	32,5
2	13	32,5
3	11	27,5
>3	3	7,5
Total	40	100

Table 3 shows that the incidence of LBW in the working area of the Kedungkandang District Health Center was the most common in female infants by 55%. Then the most birth weight babies occurred in the range of 1500-2499 grams, as much as 97.5%, and most of the LBW incidents occurred in respondents who gave birth to their first child and second child, each as much as 32.5%.

Table 4. Characteristics of Respondents Based on Exposure to Cigarette Smoke

Description	Frequency (n)	Percentage (%)
Active smoker in family		
None	8	20
1 person	21	52,5
2 person	9	22,5
>2 person	2	5
Total	40	100

Based on table 4, information was obtained that most respondents lived in the same house with a family member who smoked as much as 52.5%.

Table 5. Characteristics of Respondents Based on Maternal's Behavior in Antenatal Care (ANC)

Description	Frequency (n)	Percentage (%)
First antenatal visit		
Trimester I	25	62,5
Trimester II	15	37,5
Trimester III	0	0
ANC visits		
Incomplete (< 4 kali)	10	25
Complete (≥ 4 kali)	30	75
ANC done by		
Bidan	28	70
Dokter	12	30
Total	40	100

The study results in table 5 show that most respondents made their first antenatal visit in the first trimester, as much as 62.5%. Most respondents made the number of antenatal care visits more than four times as much as 75%. The health workers most frequently visited by respondents during ANC were midwives (70%).

DISCUSSION

Productive age is an ideal and healthy age for mothers to get pregnant and give birth because, at this age, the organs of the reproductive system work optimally, so the frequency of respondents who are ready to accept pregnancy and childbirth is more in that age category. However, according to the study results, many respondents in the working area of the Kedungkandang District Health Center give birth to babies with LBW babies. Occur because the mother's education, occupation, family income, and parity, which affect nutritional intake, are not met adequately for fetal growth. The need for nutritional intake that has not been fulfilled optimally is caused by obstacles in distributing nutrition from mother to fetus, which puts mothers at risk of giving birth to babies underweight. Therefore, changes in hormone function in the mother's reproductive organs need to be watched out for and monitored correctly because they will decrease with the increasing age of the mother (Rini & Trisna, 2016, p. 9). The results of this study align with the research of Tuti Meihartati (2016), which stated that most LBW events occurred at the age of mothers who were not at risk (64.9%). This incident may occur due to other factors that can affect the incidence of LBW, such as chronic (heart) disease, complications during childbirth such as pre-eclampsia, fetal factors such as congenital disabilities, and malnutrition during pregnancy (Meihartati, 2016, p. 75).

Education is a conscious effort to develop personality and the ability to reason in making better use of healthcare facilities (Hafid et al., 2018, p. 5). A highly educated mother will be more open to receiving health-related information and be able to determine or assess that health services can help someone reduce the risk of early pregnancy disorders (Permana & Wijaya, 2019, p. 677), Whereas mothers with low education find it difficult to accept innovation, and most do not know the importance of prenatal care and have

limitations in consuming nutritious food (Rini & Trisna, 2016, p. 11). Based on the results of the study, there are still many respondents who have not been able to receive health-related information, so they have difficulty implementing it in everyday life.

The results of other studies write that people in general still tend to imitate family habits and follow the advice of respected family members, one of which is to abstain from food during pregnancy which is done without the supervision of health workers, can cause a lack of nutritional intake in the mother (Hartiningrum & Fitriyah, 2019, p. 101). However, there are differences in the results of other studies, which say that the mother's educational background is not a risk factor for LBW events. Mother's knowledge is not only determined by the final academic educational background, but with the convenience of today's technology, mothers can more easily access information via the internet and through the role of midwives who are directly involved in providing KIE (communication, information, and education) to pregnant women during antenatal visits (Sholiha et al., 2015, p. 62).

Mothers who do not work are housewives (IRT). Work-related to the economy and physical activity of the mother during pregnancy can lead to pregnancy. In another study, it was written that tiring physical activity and lifting heavy objects during pregnancy must be avoided because mothers need to get enough rest (Fajriana & Buanasita, 2018, p. 76). In this study, the incidence of LBW babies in pregnant women who work as housewives occurs because mothers without work lack relationships, so health information is still low. Family income is classified as low, so mothers cannot meet the nutritional intake their fetuses need. This study's results follow other studies, suggesting that the likelihood of LBW occurring in pregnant women who work is 0.098 times smaller than that of pregnant women who do not work (Rini & Trisna, 2016, p. 6).

Respondents in the work area of the Kedungkandang District Health Center have a relatively low income, namely IDR 500,000-IDR 1,500,000, because only their husband work. The amount of income affects the quality of maternal health and nutrition during pregnancy. In addition, families with low economic status tend to live in inadequate housing environments and facilities, which affects the health of the mother and family (Fajriana & Buanasita, 2018, p. 74). However, it is different from the results of other studies, which state that the level of family income is not related to the incidence of LBW due to other unknown factors, such as the allocation of family income to fulfilling needs, especially meeting the nutritional needs of mothers during pregnancy (Sholiha et al., 2015, p. 61).

Premature or preterm birth impacts fetal organ growth that is not optimal, thus affecting the baby's weight at birth. The baby's weight is influenced by the presence of nutritional factors that have not been fulfilled both before pregnancy and during pregnancy and a history of diseases that the mother suffered during pregnancy (Moradi et al., 2021, p. 403). The physical and psychological pressure experienced by the mother, both from the internal and external environment, also triggers an increase in the hormone cortisol and encourages the release of prostaglandins so that the uterus contracts prematurely. This condition has the potential to give birth prematurely, which will increase the likelihood of babies born with low weight (Jumhati & Novianti, 2018, p. 117).

The ideal birth spacing for mothers giving birth to their next child is over two years because the body needs enough time to repair supplies and reproductive organ. However, according to the study results, many mothers in the pregnancy interval category of more than two years give birth to LBW babies. The possibility of this happening is due to other influencing factors such as socioeconomic factors (education, mother's occupation, and

family income), obstetrics (gestational age at birth and maternal parity), and exposure to cigarette smoke. showed the same results, namely that there was a relationship between pregnancy spacing and LBW incidence, with the result that babies with birth spacing <2 years were born with LBW by 83.6%, while babies born with birth spacing ≥ 2 years and experiencing LBW were 37. 5% two years. The shorter the pregnancy interval, the higher the incidence of LBW (P. A. Kusumawardani & Cholifah, 2018, p. 154).

Women who are pregnant and give birth to more than two children can cause a decrease in the elasticity of tissues that have been stretched repeatedly due to pregnancy so that in subsequent pregnancies, they tend to experience abnormalities in the location of the fetus and placenta, women who are more frequently pregnant become more anemic and malnourished in pregnancy so that it can cause labor prematurity, barriers to fetal growth and development to give birth to LBW babies (Putri et al., 2018, p. 83). The results of this study are supported by other studies which found that the risk of mothers with parity > two children will contribute to the birth of babies with LBW as much as 1.3 times higher than mothers with two children or less (Arsyi, 2021, p. 4201)stunted growth, and neonatal mortality. In this study, we aim to examine the maternal factors associated with LBW in Indonesia. This study uses a cross-sectional design, and data were obtained from the 2017 Indonesian Demographic and Health Survey (IDHS. However, other studies results are inconsistent, which state that there is no relationship between parity and the incidence of LBW as long as nutritional needs before and during pregnancy are adequately met (Imannia et al., 2019, p. 27)prevalence of LBW is 15.5%, amounting to approximately 20 million LBW infants born each year. According to several previous studies, factors closely related with the incidence of LBW are high birth rates, shorter birth intervals, and low frequency of Antenatal Care (ANC).

Weight gain can be indicated to assess the nutritional status of the mother (Trisnawati, Y. & Utami, T., 2017). In the study's results, there were still 32.5% of pregnant women whose weight gain was less than 10 kg and who gave birth to LBW babies. Standard. Weight gain during interrupted pregnancy can be caused by poor sanitation and lack of adequate nutritional intake. (Anil et al., 2020, p. 7)as well as long-term consequences like the onset of noncommunicable disease in the life course. A large number of mortality and morbidity can be prevented by addressing the factors associated with low birth weight. The main objective of this study was to identify associated risk factors of low birth weight. Methodology: A health facility-based unmatched case-control study was carried out from July 2018 to March 2019 among the mothers who delivered in health facilities of Dang district of Nepal from 17th August to 16th November 2018. The total sample size for the study was 369; 123 cases and 246 controls. Cases and controls were randomly selected independent of the exposure status in the ratio of 1:2. Information regarding exposure status was assessed through interviews and medical records. Mothers who delivered outside Dang districts were excluded from the study. Ethical clearance was obtained from the Institutional Review Committee (IRC. Good nutritional status of the mother can be assessed from the weight gain during pregnancy which is in accordance with the standard of weight gain according to the mother's body mass index before pregnancy. The drawback in this study was that there was no data on maternal BMI before pregnancy, so it could not be assessed whether maternal weight gain during pregnancy was in accordance with the recommended maternal weight gain according to maternal BMI before pregnancy. Therefore, this study used prepregnancy weight and during pregnancy to estimate the risk of LBW babies.

Mid-Upper Arm Circumference (MUAC) during pregnancy is an effort to measure subcutaneous fat and muscle to determine protein reserves in the pregnant woman's body. MUAC size of 23-33 cm indicates that the mother's nutritional status is normal (Fakier et al., 2017, p. 606). The data of this study shows that the respondents in the work area of the Kedungkandang District Health Center who gave birth to LBW babies majority had MUAC sizes within normal limits or were not at risk of chronic energy deficiency. So that the incidence of LBW can be caused by other factors, such as the diet consumed by the mother not fulfilling balanced nutrition and the mother does not adopt a healthy diet. Measuring MUAC during pregnancy needs to be done in order to be able to measure nutritional status and state of food consumption, especially energy and protein in the long term (Babu et al., 2021, p. 8).

The literature study found that many studies related to LBW reported the prevalence and proportions in which newborns were significantly more susceptible to LBW events (Gebremeskel et al., 2022, p. 127). The results of this study are supported by other studies, which state that female babies are at 1.41 more significant risk of experiencing low birth weight than male babies, this assessment is carried out on average pregnant women whose gestation period is the same, and it is found that the weight of the female fetus is smaller than the weight of the male fetus, so there is a greater risk of LBW at birth. Therefore, nutritional needs during pregnancy still need to be considered to minimize the incidence of LBW (Pramono & Paramita, 2015, p. 8).

The birth weight reflects the growth of the fetus during pregnancy. Accurate measurement of birth weight helps to identify future health risks (Biks et al., 2021, p. 3). Infants with a birth weight of fewer than 2,500 grams have a high risk of mortality and morbidity due to infectious diseases, are underweight, stunting, or very thin during childhood, and have four times the risk of experiencing neonatal death than babies born with an average weight (Karima & Achadi, 2012, p. 116). The data of this study show that mothers in the working area of the Kedungkandang District Health Center who give birth to babies with low birth weight are quite high, which are influenced by 16 factors, as found in the results of this study. The increase in the number of LBW babies also occurred in Tasikmalaya City, where in 2018, there were 308 LBW babies, increasing to 360 LBW babies in 2019 (Azizah et al., 2021, p. 285).

The sequence of pregnancies can affect the baby's birth condition. The majority of babies born in the first order have a greater likelihood of experiencing LBW than babies born later in the same family. There is an influence on the mother's health conditions where mothers who are pregnant for the first time tend to experience excessive anxiety about their pregnancy because it is the first experience, especially for mothers who are not exposed to information related to pregnancy (Amri et al., 2020, p. 221). The results of this study indicate that most mothers are not ready physically or mentally for their pregnancy and have not been able to apply the things recommended by health workers in efforts to prevent LBW, such as maintaining a balanced diet, adequate rest, reducing physical activity that burdens the mother and the fetus, as well as the ability to manage the psychological condition of the mother because it is the first time a mother has experienced pregnancy.

Based on the results of the study, it was found that pregnant women who live in the same house with family members who smoke will be more prone to give birth to LBW babies. Cigarette smoke contains chemicals such as free radicals, carbon monoxide, nicotine, and tar which, if inhaled by pregnant women, can interfere with the function of hemoglobin in the mother's blood which is responsible for distributing oxygen and nutrients to the fetus

so that it can damage brain tissue and lungs in the developmental stages of the unborn child. The results of this study are relevant to previous research, which stated that mothers exposed to cigarette smoke have lower birth weights than mothers who are not exposed to cigarette smoke because cigarettes contain harmful chemicals such as nicotine, cotinine, and carbon monoxide, which if inhaled by other people, can also cause health problems (Fajriana & Buanasita, 2018, p. 77).

Mothers who gave birth to babies with LBW in the working area of the Kedungkandang District Health Center were found to mostly have their first antenatal visit in the first trimester because the mother experiences a lot of anxiety and curiosity about the condition of the fetus. Most of the respondents in the Kedungkandang District Health Center working area were good at making antenatal care (ANC) visits because the mother experiences a lot of anxiety and curiosity about the fetus's condition. Most of the respondents in the working area of the Kedungkandang District Health Center were good at conducting antenatal care visits (ANC) and properly implementing government programs that recommend that ANC visits be made at least four times during pregnancy. The frequency of ANC plays a role in reducing the incidence of low birth weight babies, for this reason, the encouragement to carry out ANC needs to be continued because ANC visits are an essential indicator in increasing awareness and monitoring of the nutritional health of the mother during pregnancy and the fetus (Nagatani et al., 2023, p. 7). Little attention has been given to the early initiation of ANC. The present study assessed the influence of delayed and fewer ANC visits on LBW in the country. **Methods:** This is a retrospective cohort study conducted at Salavan Provincial Hospital. Study participants were all pregnant women who gave birth at the hospital between 1 August 2016 and 31 July 31 2017. Data were collected from medical records. Logistic regression analyses were performed to quantify the relationship between ANC visits and LBW. We also investigated factors associated with inadequate ANC visits: first ANC visit after the first trimester or < 4 ANC visits. **Results:** The mean birth weight was 2808.7 g [standard deviation: SD 455.6]. Among 1804 participants, 350 (19.4%).

The latest WHO guidelines state that a minimum of 8 antenatal care visits are made during pregnancy, this minimum number of visits is not only assessed in terms of quantity but also in terms of quality which includes many things such as anamnesis, physical examination (general and midwifery), laboratory tests for indications, and primary and extraordinary interventions (according to existing risks including counseling and counseling). With the existence of quality ANC services, it is hoped that it will be able to change the behavior of mothers to be more vigilant during the pregnancy period. The results of the study showed that even though she made a complete pregnancy visit >4 times, there are still many mothers who give birth to LBW babies. Other factors such as maternal parity, socioeconomic status, physical and psychological health conditions of the mother, The inability of the mother to implement recommendations from health workers regarding the health problems experienced by the mother can be another influencing factor, while for the quality of ANC where the researchers did not obtain the data, so it became a weakness in the results of this study. Inadequate ANC visits are associated with an increased incidence of LBW (Zhou et al., 2019, p. 7).

Research conducted by Fatimah, et al (2017) found that the most visited health workers during pregnancy checks were midwives (85,7%) (Fatimah et al., 2018, p. 617), in this study, similar results were also obtained, namely that most ANC visits were made to midwives. In this study, one of the reasons mothers tend to choose midwives is because road access is closer and easier to reach, and there are more midwives scattered in each sub-district which is the working area of the Kedungkandang District Health Center. Midwives are health workers who have the most role in providing health services to pregnant women

but found no significant relationship between health workers visited by mothers during ANC and the incidence of LBW (Fatimah et al., 2018, p. 619). In addition, economic factors that are classified as a lower middle class make mothers tend to prefer to have pregnancy checks at the midwife.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of research regarding the description of the factors that influence the incidence of low birth weight (LBW) babies in the working area of the Kedungkandang District Health Center, Malang City, it can be concluded that 14 factors influence the incidence of LBW which can come from the mother, fetus, environment and the number of visits, during pregnancy to health services.

Recommendation

The limitations of this research are the limited number of research samples and the research location, which only involves one community health centre. So, in the future, there needs to be further research to see what determinant factors most influence the incidence of LBW and carried out in a broader area and with a larger population.

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PRESCHOOLER DEVELOPMENTAL STIMULATION PRACTICE DURING THE COVID-19 PANDEMIC

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ABSTRACT

Background: Stimulation is one of the important factors in supporting optimal child development. The COVID-19 pandemic causes a lack of stimulation due to activity restrictions, thus impacting the parenting pattern of children. **Purpose:** The purpose of this study was to describe the practice of developmental stimulation provided by families for children aged 3-5 years during the COVID-19 pandemic. **Method:** The research design used descriptive qualitative research with data collection techniques in interviews, observation, and documentation. This research was conducted at the Cebongan Health Center, Salatiga City, Central Java in March and April 2021. The research participants were the primary caregivers of 10 families with children aged 3-5 years. The technique of determining participants was carried out using the snowball sampling technique in which key informants, namely Posyandu cadres, assisted in the determination of participants. Data validation in this study used source triangulation to obtain valid data. **Result:** This study resulted in four themes: developmental stimulation is important for children, stimulation practices for children during the COVID-19 pandemic, reward children to increase their confidence, and there are no barriers to providing stimulus for children during the COVID-19 pandemic. **Conclusion:** The stimulation caregivers provide during a pandemic varies in the form of developmental stimulation exercises, the use of educational toys, and audio-visual media. Suggestions are that the child's main caregivers continue to find out and practice stimulation of fine motor, gross motor, language, and speech as well as socialization with children.

Key words: covid-19, developmental, practice, stimulation

INTRODUCTION

Development is an increase in the function of processes related to the body and mind (Levine, D.A., 2019). According to Rahmawati, I. (2016), children need assistance in comprehensive growth and development during the child development period. Therefore, stimulation is needed so that children's development in motoric, language, speech, and social skills is according to the child's age. Stimulation can arouse all of the body's sensory systems and is useful for giving experience to children so they can carry out various activities that stimulate the formation of basic developmental abilities (Hati, F. S., 2019). Stimulation is essential, especially in children aged 3-5 years, because at that age, children begin to be sensitive to receiving various stimuli (Uce, L., 2017).

Age 3-5 years is the golden age where stimulation of all aspects of development plays an important role in motoric, cognitive, personal social, and language development in children. Providing stimulation to children aged 3-5 years can improve children's cognitive and motor skills properly. Conversely, the lack of stimulation given to children can cause deviations in child development and even permanent disturbances (Kementerian Kesehatan RI, 2016). Optimum child development can be achieved by providing early stimulation, so the first environment that can help optimize child development is the family environment (Elmanora, Hastuti, and Muflikhati, 2017). According to Hulukati, W. (2015), the family, especially the parents, is the main person in charge of providing stimulation for children's optimal growth and development.

Parents' Guidance and care are needed to prepare children to grow and develop well (Hulukati, W., 2015). There are several things that parents can do to improve the growth development and health of children: giving children sincere love and warmth, giving real experiences using all the senses that children have, interacting with children through chat, hugs, smiles, songs, listening and paying attention to children's babbling, giving a sense of comfort, and speaking softly to children (Lilawati, A., 2021).

The COVID-19 pandemic has had positive and negative impacts on parents in providing stimulation for their children. The positive impact is that the family can be closer to children, have lots of time to stimulate children, and know every child's development. On the other hand, the negative impact caused by the COVID-19 pandemic is that children feel bored with their daily activities, cannot explore their surroundings, and are limited in socializing with their peers (Tabi'in, 2020). The COVID-19 pandemic affects the social development of children as children's autonomy problems, language development, and fine and gross motor skills. This problem makes children lose the opportunity to play outside with their peers, thus causing decreased physical activity and increased screen time. On the other hand, the pandemic situation provides benefits that parents have a longer time to spend with their children which can increase the bond between them (Mulyani, Wanda, and Agustini, 2021).

The COVID-19 pandemic causes a lack of stimulation due to activity restrictions, while the stimulation is significantly needed to support optimal child development. This study aimed to describe the developmental stimulation provided by caregivers to children aged 3-5 years during the COVID-19 pandemic.

METHOD

The study was conducted at the Cebongan Health Center, Salatiga, in March and April 2021 using a descriptive qualitative method. Data were collected using research instruments such as interview guides, interview transcripts, and observation sheets. An interview guide was used to explore the developmental stimulation provided by caregivers for children aged 3-5 years during the COVID-19 pandemic. Developmental stimulation practices by caregivers were observed and documented on observation sheets. Observations for each family were carried out 1 to 2 times at different times. An explanation of the research process was given at the beginning of the study so that participants had the opportunity to decide whether to participate in this study or not freely. Data validation in this study used source triangulation to obtain valid data.

The participants of the study were 10 families who had children aged 3-5 years. Research participants were the child's main caregivers. The participants were determined using the snowball sampling technique with the help of key informants (Posyandu cadres) according to the criteria disclosed by the researcher. The criteria for the subject of this study were 1) participants are the main caregivers of children who spend a lot of time with children, 2) participants take care of children aged 3-5 years, 3) participants are domiciled in the working area of the Cebongan Health Center, Salatiga City, 4) participants are willing to be involved in the interview and observation.

Data analysis techniques used were data collection, data reduction, data presentation, and conclusion. The results were included in categories, then certain sub-themes were created, after which they were validated using the results of observations, and conclusions were drawn on the themes obtained.

RESULT

The participants of the study were composed of caregivers and their children aged 3-5 years. Table 1 illustrates the characteristics of the participants.

Table 1. Participants' Characteristics

The Caregivers Profile				The Child's Profile	
Code	Age (years)	Participant's Relationship with the Child	Occupation	Age of Child (years)	Gender
P1	29	Mother	Not Employed	5	Boy
P2	41	Mother	Not Employed	4	Girl
P3	28	Mother	Not Employed	4	Girl
P4	30	Mother	Not Employed	5	Girl
P5	71	Grandmother	Not Employed	3	Boy
P6	34	Mother	Not Employed	4	Girl
P7	28	Mother	Self-Employed	4	Boy
P8	26	Mother	Not Employed	4	Girl

P9	32	Mother	Factory Worker	4	Boy
P10	33	Mother	Not Employed	4	Girl

Table 1 shows that the majority of the participants are not employed, so they spent most of their time with children. Two participants (P7 and P9) had jobs, consecutively as self-employed, and factory workers. The two participants had limited time to spend with their children, in the morning before going to work and in the afternoon after work. However, during the day, their children were cared for by family members such as the child's grandmother, father, aunt, brother, or sister. The participants mostly are the child's biological mother and only one participant is the child's grandmother.

Based on the results of interviews conducted with the ten participants, four themes were found including developmental stimulation is important for children, stimulation practices for children during the Covid-19 pandemic, reward children to increase their confidence, and there are no barriers to providing stimulus for children during the Covid-19 pandemic. The four themes of this research are as follows:

a. Developmental Stimulation is Important for Children

Based on the results of the interviews with the ten participants, seven participants confessed that they understood the term developmental stimulation, while the remaining three participants did not know the term. However, all of the participants agreed that developmental stimulation is important for children to support and improve the development of children's intelligence. These expressions are presented as follows:

"Penting mbak, untuk perkembangan kecerdasan anak (the stimulation is important for child's development)" (P1)

"Iya. untuk menunjang perkembangan anak, gitu ya (the stimulation is important to support child's development)" (P2)

"e penting. karena yo anak kan harus mengenal lingkungan sekitar, otaknya harus berkembang sesuai dengan usianya (the stimulation helps children to learn their environment and promote age-appropriate brain development)" (P4)

"Penting. Tumbuh kembang anak, kecerdasannya bisa meningkat gitu sesuai usia (the stimulation helps children to promote their cognitive ability)" (P 10)

b. Stimulation Practices for Children During the Covid-19 Pandemic

Table 2 displays the stimulation practices for children by the participants during the Covid-19 pandemic. The stimulation practices included gross motor stimulation, fine motor stimulation, speech and language stimulation, and socialization as follows:

Table 2. Stimulation practices during the Covid-19 Pandemic

Developmental Areas	Stimulation Practices	Frequency
Gross Motor Skills	Playing ball (P1)	Sometimes (P1)
	Pick up a stuff (P1, P3, P5,P7, P9, P10)	Every day (P2) Every day (P3)
	Riding a bicycle (P1, P2, P4, P8)	Every day (P4)
	Swimming (P2)	Every day (P5)
	Jumping (P2)	Every day (P6)
	Running (P2, P5, P6)	Every day (P7)
	Playing toys (P5, P7)	Every day (P8)
	Dancing (P10)	Sometimes (P9)
	Tidy up toys (P4)	Sometimes (P10)
	Washing dishes (P2, P6)	
Fine Motor Skills	Drawing (P1,P2, P6, P8, P9, P10)	Sometimes (P1)
	Puzzle (P1, P6, P8, P9, P10)	Every two days (P2) Every day (P3)
	Writing (P1, P4,P6)	Every day (P4)
	Coloring (P5)	Every day (P5)
	Cutting (P7, P9, P10)	Every night (P6)
	Playing collage (P8)	Every day (P7)
	Pretend play (P3, P6)	Every day (P8) Every night (P9)
		Sometimes (P10)
Speech and Language	Talk to children using Bahasa and Javanese (P1, P2, P4, P5, P6, P7, P8, P9, P10)	Every day (P1) Every day (P2) Every day (P3)
	Teach children to recite and memorize Quran (P1, P3, P8)	Every day (P4)
	Teach language from TV and social media (YouTube, TikTok) (P2, P3, P4, P6, P8, P9, P10)	Every day (P5) Every day (P6) Every day (P7) Every day (P8) Every day (P9) Every day (P10)
Social Skills	Encourage children to interact with family members and other children around (P1, P2, P3, P4, P5, P6, P7, P8, P9, P10)	Every day (P1) Every day (P2) Every day (P3) Every day (P4), Every day (P5), Setiap hari (P6) Every day (P7) Every day (P8) Every day (P9) Every day (P10)

The stimulation provided by the family to children during the COVID-19 pandemic included gross motor, fine motor, speech, and language as well as socialization. Based on the interviews and observations, it was found that gross motor stimulation was given to

children by asking children to pick up things, play ball, ride a bicycle, play with toys, and let children wash dishes with the frequency of stimulation given every day and whenever the child asked it. Fine motor stimulation was given to children by encouraging children to draw, compose puzzles, write, control small items such as holding pens, coloring, cutting, playing with collages, and doing pretend play such as cooking, playing as a mother, playing as a father. Speech and language stimulation was provided for children by talking to children using Bahasa and Javanese, reciting and memorizing the Quran, and watching TV as well as social media applications such as "TikTok" and YouTube every day. Stimulation of socialization given to children was encouraging children to always interact with family, friends, and other children around every day.

The developmental stimulation to children at home is not only provided by the mother but also by other family members such as the child's father, grandmother, aunt, brother, and sister. These expressions are stated as follows:

"yang paling memberi stimulasi ya saya, kadang mbahnya (I used to give the stimulation, sometimes his grandmother)" (P1)

"ya pasti saya karna kan saya ibunya, terus bapaknya, dan sama kakaknya juga (I, her mother, who give the stimulation, as well as her father and sister)" (P2)

"yang latih ya ibunya, saya budhenya (the stimulation was provided by his mother, I am his aunt) (P9)

The participants stated that during the COVID-19 pandemic, they disallowed their children to play outside too far. However, the participants allowed their children to invite their friends to play at home or play at the farm and encouraged them to use masks and wash their hands often. These expressions are presented as follows:

"ga bosen sih mbak, palingan main ke kebon sama kakak-kakaknya (during the Covid-19 pandemic, my son does not feel bored, he likes playing at farm with his cousins)." (P1)

"Disini ada yang reaktif saja saya bilang jangan jajan disana nanti corona, ia ga mau jajan lagi. Jadi sekarang kalau mau kemana-mana ada tempat cuci tangan, pasti minta untuk cuci tangan, keluar pun pakai masker (If someone got Covid-19, I disallowed my child play outside. She always uses a mask and wash her hands anywhere when she is not at home)." (P3)

"Dolanan main sama temen-temennya yang biasa itu loh. Temennya ya diajak ke rumah (during pandemic, my son invites his friends playing at home)." (P5)

c. Reward Children to Increase Their Confidence

Based on the results of interviews, it was found that all participants gave praise to children such as saying "great", "you are smart", applauding and even giving presents to children to increase their confidence. These expressions are stated as follows:

"kalau mau bantu-bantu gitu, oh hebat, cah pinter (Great! Thank you for helping)" (P4)

"iya. Ya di puji. Tepuk tangan dan di cium (applauding and kissing)" (P5)

"iya, pasti. Ih pinter nanti belik'e mainan ya (You are smart, Mom will get you a present)" (P7)

"ya kalau pujian selalu. Apapun itu, pasti saya acungi jempol, hebat atau gimana. Biar anak itu punya semangat untuk lebih dari pada itu (I always praise her by giving thumb up, saying 'great' to increase her confidence" (P8)

c. There are no Barriers to Providing Stimulus for Children during the Covid-19 Pandemic

Based on the results of the interviews, it was found that the majority of the participants were not employed so they spent a lot of time with their children. Only the two participants (P7 and P9) had limited time to provide stimulation for their children because of work. These expressions are stated by the participant as follows:

"iya. Hee, kalau sore gitu. kalau siang main ke tempat budhenya, soalnya saya kan jaga toko (Because I have to work, I left my child to his aunt)" (P7)

"ya, cuman malem. Kan sistem kerjanya borongan (I have time with my child in the evening, after work)" (P9)

Based on the results of interviews, it was found that all participants had no obstacles in providing stimulation for children before and during the COVID-19 pandemic. These expressions are stated as follows:

"boten. Mudah sih, mudah untuk dikasih tau anaknya (There is no difficulty in giving stimulation, everything is okay)" (P3)

"Ga ada hambatan dan ga ada perbedaan sih mbak kalau untuk memberikan stimulasi (There are no barriers and differences in giving stimulation before and during the Covid-19 pandemic" (P4)

"Ya ga ada. Perkembangannya itu naik sesuai usianya (My child's development has increased according to his age)" (P5)

"Ga ada perbedaan ik sama aja (There are no differences in developmental stimulation before and during the Covid-19 pandemic)" (P7)

"Alhamdulillah tidak. Ga ada perbedaan (Thanks God, there's no differences in developmental stimulation, before and during the Covid-19 pandemic)" (P8)

According to participants (P2, P9, and P10), sometimes their children get bored with the same activities during the Covid-19 pandemic. Participants have ways to overcome children's boredom by letting them choose the activities they like and having a walk outside with children. These expressions are stated below:

"ya bosen. dia keluar main sepeda, minta jajan (Sometimes she gets bored, so she asks some snacks or riding her bicycle)" (P2)

"kadang bosen. Jadi saya biarkan kalau ga ya di depan, maksudnya main di depan atau jangan di rumah. Saya bebasin aja untuk main (I let her playing what she likes outside house)" (P3)

“Sebenarnya ya bosan. ya paling diajak keluar sebentar, kemanalah. Paling sekitar sini, yang dekat-deket (When he gets bored, I bring him to walk outside)” (P9)

“Bosen. iya penghiburnya ya cuman Hp itu (If she gets bored, she plays handphone)” (P10)

DISCUSSION

Developmental Stimulation is Important for Children

The form of family support that is very influential for the growth and development of children is stimulation. The finding of this study shows all the participants agree that developmental stimulation is important for children. Stimulation can be fulfilled by parents or other family members (caregivers). Widianingtyas (2016) explained that families through parents or other family members can help provide stimulation to children in all aspects of development including gross motor, fine motor, language, and socialization. Children who receive regular stimulation have a good developmental effect. The finding supports the previous studies conducted by Kusumanegara, Hardaningsih, and Rahmadi (2015) that stated there is a significant relationship between stimulation provided by family and children’s development ($p < 0,001$).

Stimulation Practices for Children during the Covid-19 Pandemic

Parental stimulation in child development is a method used in an ongoing process of interaction between parents and children to form a warm relationship and facilitate children’s development of their abilities which include the development of fine motor, gross motor, language, and social skills according to their stage of development (Haryanti, Ashom, and Aeni, 2018). Stimulation is also important in the development of children. Children who get a lot of directed stimulation from parents will develop faster than children who receive less or even no stimulation (Rihlah, 2019). According to the finding of this study, the participants has provided developmental stimulation including gross motor, fine motor, speech, and language as well as socialization through playing. This finding supports the study wherein Rantina et al. (2020) reported that during the COVID-19 pandemic, parents stimulate speech and language development by talking to their children, asking for their name and their activities throughout the day, motor development is stimulated by urging their children to jump, to run, to climb, to catch the ball, to walk around the house, and to read the Quran as well as to pray and *Sholat* together to introduce religious and moral values. Social and emotional development is stimulated by getting children used to queuing, discipline, and independence during play, and play buying and selling. Cognitive development is stimulated by asking the child to count the toys or fruits on the table, while artistic development is stimulated by singing, coloring, and playing musical instruments such as piano, and drum. The findings also validate the study of Helvianis and Rantina (2021) who reported that during the COVID-19 pandemic parents stimulated the speech and language development of their children through playing with dolls, playing with cars, watching YouTube, drawing and singing together, playing with other family members, playing at the yard and walking around the house. Said studies all established that the stimulation provided by parents during the COVID-19 pandemic varies in the form of developmental stimulation exercises, the use of educational toys, and audio-visual media. Suryani et al. (2021) stated playing is a form of stimulus that is suitable for childhood. The

world of children is a play, through playing children will learn various things, as provisions for children's future lives.

During the COVID-19 pandemic, there were activity restrictions by the government, therefore it could affect the playing activities of children. Mulyani, Wanda, and Agustini (2021) stated that the bad things children experienced during the COVID-19 pandemic were stress, no opportunities to play with friends, activity restrictions, weight gain, sleep longer, increased sitting time, and increased screen time. Contrary to the study of Mulyani, Wanda, and Agustini, the finding of this study shows that the participants gave opportunities to their children to play with friends outside but not too far from home. The participants let their children play whenever they asked it. But it was true that the COVID-19 pandemic increased screentime for the children. Children learned and played from television, YouTube, and "TikTok" every day, so it increased screen time.

Reward Children to Increase Their Confidence

Children need love, especially from their parents. The love from parents or family members can be fulfilled by talking, touching, and kissing (Sakdiah, 2017). Rohma (2018), explained that rewards such as praise from parents and family can make children more courageous and excited to try new things to present their creativity. Family is one of the factors to form a child's self-confidence by providing motivation and giving appreciation for the efforts made by children. The motivation and appreciation that the family gives will make the child enthusiastic and continue to practice and increase the child's self-confidence.

There are no Barriers to Providing Stimulus for Children during the Covid-19 Pandemic

Family is the most important social network for children. The fulfillment of the basic needs of children is mostly good and shows that the parenting style used by parents has met the needs of children according to their growth and development state. Mother is a very important person in the household. A mother is someone who has the role of educating, nurturing or caring for, giving affection, and being a role model for children. Mulyani, Wanda, and Agustini (2021) stated that during the COVID-19 pandemic, parents experienced stress because parents had additional tasks to stimulate the development of their children at home.

Contrary to the study of Mulyani, Wanda, and Agustini, the finding of this study shows that the participants have no obstacles or differences in performing developmental stimulation before and during the COVID-19 pandemic. During the COVID-19 pandemic, children spend more time at home playing and doing their activities so parents and families can pay more attention to stimulate the development of their children. The developmental stage of children increases according to their age, either through direct stimulation from parents, through games, through the family, through the socialization of children with peers, or their environment. Mufaziah and Fauziah (2021) stated that the obstacles faced by parents are not so influential because parents already understand their characteristics in providing stimulus, understand children's different interests, and past experiences that influence parents when giving the stimulation, and also continue to motivate children to develop according to the child's age even during a pandemic.

During the pandemic, sometimes children get bored with the same activities every day. Encouraging children to play outside and interact is considered effective for overcoming children's boredom at home while using a mask and washing hands often while playing

outside. Playing aims to optimize children's development. In playing, children can be stimulated to show their abilities related to other aspects of development such as motoric and social skills. Playing activities can be done inside or outside the house such as visiting recreational areas. Saadah, Suparji, and Sulikah (2020) stated that recreation aims to refresh physically and spiritually. Therefore, play and recreation are important for children to leave their daily routines for a while so that they feel free, happy, not bored, and excited to continue other activities.

CONCLUSION AND RECOMMENDATION

Conclusion

This study described the developmental stimulation practices for children during the Covid-19 pandemic. The study indicates that stimulation practices provided by parents and families include gross motor, fine motor, social, speech, and language skill stimulation. The COVID-19 pandemic was believed to impair the developmental stimulation practice of children. However, the COVID-19 pandemic does not alter the developmental stimulation of children provided by caregivers.

Recommendation

It is recommended that caregivers continue to find out and practice stimulation of fine motor skills, gross motor skills, language, and speech as well as socialization of children so that children's development can be optimal according to their age.

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THE EFFECTIVENESS OF GIVING OXYTOCIN MASSAGE IN INCREASING BREAST MILK PRODUCTION IN POST PARTUM MOTHERS: A CASE STUDY

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ABSTRACT

Background: Breast milk is necessary for a baby's growth and development after birth. Exclusive breastfeeding, or receiving sterile, direct breast milk from the mother, offers the advantage of lowering digestive issues when compared to alternative diets. There are two methods—pharmacological and non-pharmacological to boost breast milk production. Oxytocin massage, which seeks to activate the hormones prolactin and oxytocin after giving birth and can soothe the mother, is one of the non-pharmacological methods that can be used to promote milk production. As a result, breast milk will come out naturally. **Purpose:** To determine the Effectiveness of Giving Oxytocin Massage Effectiveness in Increasing Breast Milk Production in Post Partum Mothers. **Method:** The method used in this study uses a case study with pre and post intervention. The sample in this case study was a woman who was treated with complaints of breast milk that could not flow when breastfeeding. The instruments used were milk volume measurement sheets and measuring cups. Patients were given oxytocin massage therapy for 15 minutes in 3 days. **Result:** An increase in the volume of breast milk after being given oxytocin massage to mothers who are breastfeeding, these changes can be seen every day. **Conclusion:** Giving structured oxytocin massage therapy can help increase milk production in mothers who are breastfeeding after giving birth

Key words : ASI, Oxytocin Massage, Breastfeeding

INTRODUCTION

From the time of conception until birth, a mother plays a critical role in the stages of child development. Full-term fetuses and placentas will undergo the process of ejection at delivery, either by natural delivery or cesarean delivery. (Susilowati & Tridiyawati, 2021). Breast milk is necessary for a baby's growth and development after birth. Compared to other

diets, exclusive breastfeeding, or the mother's sterile direct breast milk, has the advantage of minimizing digestive issues (Katmini & Sholichah, 2020). Breast milk contains nutrients that are beneficial for immunity, hormones, growth factors, anti-allergy, antibodies, and anti-inflammatory properties for infections in infants. A lack of proper nutritional absorption, particularly in the case of diarrhea, occurs in infants who drink formula milk between the ages of 0 and 6 months due to their susceptibility to infection. Formula-fed newborns are 4.14% more likely to experience diarrhea than exclusively breastfed infants. Additionally, infants who drink formula milk had a 4.3% higher chance of developing obese than infants who drink breast milk. (Dewi Aminasty Siregar, 2022) mother feel that he does not have sufficient milk production to meet the needs of the baby and support increase heavy body baby which adequate because breast milk no out or production not enough fluent. Care that effective for multiply production breast milk Among other with To do care breast or breast care with guard cleanliness and (massage.

According to Sandriani, et al (2023), Husbands who don't support the practice, giving incorrect information by healthcare professionals, and having the baby delivered at the first hospital are all factors that might contribute to the failure of exclusive breastfeeding. Failure is also influenced by family-type variables, particularly the impact of grandmothers. breastfeeding support (Sandriani et al., 2023). The characteristics of the mother (knowledge, education, occupation, age, parity, and ethnicity), the characteristics of the infant (birth weight and the infant's health condition), the environment (trust, family support, housing and socioeconomic), and the services (pregnancy checks, lactation counseling, place of delivery, birth attendant, and policy) are additional factors in the failure of exclusive breastfeeding. (Sri Wahyuningsih et al., 2022).

There are two ways to increase milk production, namely pharmacological and non-pharmacological. Pregnant women class program, oxytocin massage intervention (Triansyah et al., 2021), mermaid massage (Mudrikatin & Wati, 2020) newborns who are supposed to be breastfed early will be delayed and as an alternative are given formula milk. The smoothness of the process of lactation or the production and production of breast milk is influenced by breast care, frequency of breastfeeding, maternal psychology, maternal health, and contraception, as well as breast milk production, which is strongly influenced by physical, psychospiritual, environmental and social. Efforts to stimulate the hormones prolactin and oxytocin can be done with breast care or massage, oxytocin massage, nipple cleansing, early and regular breastfeeding and marmet techniques or milking and massage techniques. The "BOM" method (Breastcare, Oxytocin Massage, and Marmet Technique, breast Care (Nour Khasana et al., 2023), the use of aromatherapy and music therapy methods is an effort to increase the production and quality of breast milk (Dağlı & Çelik, 2022). The oxytocin massage technique is one of the non-pharmacological ways to boost milk production. Specifically, massage from the spine to the twelfth sternum, which seeks to increase the chemicals prolactin and oxytocin after childbirth that can soothe the mother and cause the milk to flow out naturally. The purpose of oxytocin massage is to stimulate the postpartum mother's vertebral (spinal) oxytocin hormone. (Azizah & Ambarika, 2022).

The neurotransmitter that causes the medulla oblongata to be activated and send a signal to the hypothalamus in the posterior pituitary is where oxytocin is first released (Lismediati et al., 2022). prolactin production and oxytocin release are the two hormones that can contribute to the production of breast milk. By sucking the baby's mouth or applying an oxytocin massage to the mother's spine, which would cause her to express milk, it is possible to remove the oxytocin hormone (Sinambela et al., 2020). Before nursing, a good oxytocin massage should be performed, which is done twice over a 3-5 minute period. (Hemi

Fitriani, and Nadira 2019) Oxytocin Massage, and Suggestive Technique. Previous studies have shown significant effectiveness in the application of oxytocin massage to help expedite breast milk in mothers who are breastfeeding (Katmini & Sholichah, 2020; Triansyah et al., 2021; R. Wulandari et al., 2022)

METHOD

The method used in this study uses case study with pre and post intervention. The sample in this case study was a woman who was treated with complaints of breast milk that could not flow when breastfeeding. The instruments used were milk volume measurement sheets and measuring cups. Patients were given oxytocin massage therapy for 15 minutes in 3 days.

Case Report

A 16 year old woman with complaints of difficulty expressing milk, hardened and sore nipples, the patient said her baby was not sucking continuously and found it difficult to breastfeed. The mother also said she was worried about her condition because she could not breastfeed normally.

Clinical findings

The results of the physical examination were obtained

1. Vital signs BP : 130/ 90 mmHg, S : 36, 9°C, SPO2 : 99% , N : 100x/m, RR : 20x/m
2. Nipples and breasts feel hard
3. Pain when pressed
4. Mother is worried

Therapy given

1. Ringers Lactate 500 ml
2. Treatment Metamizole (sodium monohydrate) 500 mg / 8 hours via intravenous
3. Metronidazole 500 mg 3x1 orally after meals
4. Mefenamic Acid 500 mg 3x1 orally after meals
5. Albuforce Capsule 2x1 after meals

Laboratory result

Examination Name	Results	Unit	Reference Value
HEMATOLOGY			
Complete Hematology			
Hemoglobin	12.1	gr/dL	12-14
Hematocrit	34.0 (L)	%	35-47
Leukocytes	10.20	10 ³ /μL	4.5-11
Platelets	354	10 ³ /μL	150-450
Erythrocyte	3.84	10 ³ /μL	3.8-5.2
MCV	88.5	fL	79-99
MCH	31.5(H)	pg	27-31
MCHC	35.6	g/dL	33-37
RDW-CV	12.7	%	11.3-13.4
Count the Types of Leukocytes			
Lymphocyte %	28.0 (L)	%	30-34.5
MXD%	5.5	%	
Neutrophil %	66.5(H)	%	36-66
Lymphocyte#	2.9	10 ³ /μL	
MXD#	0.6	10 ³ /μL	
Neutrophil#	6.7	10 ³ /μL	
COAGULATION			
Freezing period	1'28''	Minute	1-3
Bleeding period	2'32''	Minute	1-6

RESULTS

Table 1. Pre and Post Intervention Breast Milk Production Results

Milk volume	Before the massage			After massage		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
	2 ml	5 ml	10 ml	5 ml	20 ml	50 ml

Based on Table 1, it was found that there was an increase in the volume of breast milk after being given oxytocin massage to mothers who were breastfeeding, these changes could be seen every day and there was a significant increase on the third day of 30 ml.

DISCUSSION

In most cases, the mother's breast milk supply will be adequate for babies, even twins. However, research consistently shows that the majority of postpartum moms worry about whether their milk supply is adequate (Katmini & Sholichah, 2020). here are four elements that influence breast milk production, one of which is psychological. If a mother is under stress or has anxiety, depression, or other psychological issues, this might reduce milk production. (Widia & Meihartati, 2018). According to research by Wulandari et al.,

(2022) the amount of breast milk measured after giving mothers an oxytocin massage was significantly higher than the amount of breast milk measured in the control group. The findings of this study demonstrate the benefits of oxytocin massage in increasing the volume of milk production in nursing mothers.

According to Sari et al., (2017). oxytocin massage increases milk production in nursing moms by effectively boosting the release of oxytocin. In an effort to increase the release of prolactin and oxytocin after childbirth and to soothe the mother so that breast milk can be produced, an oxytocin massage is performed along the spine to the fifth and sixth ribs. (Triansyah et al., 2021). Through the limbic system, stimulation of the nipples will send impulses to the hypothalamic nerve center. The sensory nerve terminals in the nipples are many. The anterior (front) pituitary gland, which generates the hormone prolactin, receives an input from the nipples and sends it to the hypothalamus. In addition to the anterior pituitary gland, which generates the hormone oxytocin, nipple stimulation also affects the posterior (rear) pituitary gland (S. Wulandari et al., 2020).

The amount of milk secreted by each breast is measured as milk production. Interventions including oxytocin massage attempt to induce relaxation, soothe the psyche, and promote breast feeding. (Azizah & Ambarika, 2022). The muscle cells surrounding the breast glands contract, allowing the milk to flow out smoothly. Oxytocin hormone activation leads to milk discharge from the breast. After the baby is born, sucking the baby's mouth on the nipple will release neurotransmitters that stimulate the medulla oblongata to send signals to the hypothalamus in the posterior pituitary to release oxytocin, causing the breasts to secrete milk. These techniques will relax the body and relieve stress. (Roslianti et al., 2022).

A mild touch can trigger the pituitary gland to create endorphins, according to Sri Wahyuningsih et al., (2022) explanation of their study It functions as a body's natural painkiller where endorphin chemicals can stop nerve cells from sensing pain. Calming effects are another response endorphins can cause. Primiparous women typically experience discomfort and tension, which this massage helps to reduce. It is possible to send nerve impulses from the spinal cord to the medulla oblongata and the hypothalamus by massaging the muscles along the spine in the back. As a result, the posterior pituitary receives the hormone oxytocin from the hypothalamus and distributes it to the bloodstream. The blood carries this hormone into the acini ducts, where it activates the let-down reflex and raises milk production. Additionally, it will increase the hormone prolactin's secretion, which encourages these cells to produce breast milk. This oxytocin massage will ease stress, lessen edema, and prevent the production of breast milk. (Hemi Fitriani et al., 2019) Oxytocin Massage, and Suggestive Technique. The second mechanism that results from oxytocin massage is suggestive provisions; this action offers encouraging advice to promote a positive mindset that all moms must be able to make enough milk and breastfeeding is a healthy pastime. This helpful advice fosters serenity and self-assurance, which helps boost milk supply. (Nour Khasana et al., 2023).

CONCLUSION

Giving oxytocin massage therapy regularly during breastfeeding with the appropriate duration can help increase the volume of milk production in nursing mothers.

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EFFECT OF GERMINATION TIME ON ISOFLAVONE CONTENTS OF PEANUT SPROUTS (*Arachis hypogaea*)

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ABSTRACT

Background: In Indonesia, peanuts (*Arachis hypogaea* L.), a plant-based food with a high economic value, are widely available. In addition to having a high protein level, it also has other healthy ingredients including fiber and antioxidants. A complex succession of morphological, physiological, and biochemical changes occur during germination. Enzymes will restructure proteins, carbohydrates, and lipids for usage as building blocks for growth in places with growth points and as fuel for respiration. The benefits of germination include boosting various nutritional levels, removing flatulence-causing oligosaccharides, and enhancing various vitamin types. According to earlier studies, germination significantly increased the amount of isoflavones in seeds and their derivative products. **Purpose:** This study aims to identify the effect of germination time on isoflavone content including daidzein and genistein of peanut sprouts. **Method:** The Isoflavone profile was identified using High Performance Liquid Chromatography (HPLC) in three different germination times. The data obtained was analyzed statistically using one-way ANOVA with a confidence level of $p < 0.05$. **Result:** Results show that the higher isoflavone content resulted from the treatment of peanut sprouts with a germination time for both daidzein and genistein are 48 hours, 24 hours, and 72 hours, respectively. The increase in isoflavone content is caused by the hydrolysis process into isoflavone aglycones and their glucose during germination. However, the treatment without germination obtained higher isoflavone content for both standards. This is because the standards used in the analysis are only daidzein and genistein, while during the germination process isoflavones can be converted into other forms of flavonoids that have not been tested in the analysis. **Conclusion:** It could be concluded that 48 hours of germination treatment can optimally increase the isoflavone content of peanut sprouts. We suggest critical future research that could study the other conversion form of isoflavone of peanuts during germination.

Key words: daidzein, genistein, germination, isoflavone, peanut sprout

INTRODUCTION

Isoflavones are secondary metabolites that are widely synthesized by plants. However, unlike other secondary metabolites, this compound is not synthesized by microorganisms. Therefore, plants are a source of isoflavone compounds in nature (Anderson, 1997 in Pawiroharsono, 2001). The antioxidant action of the isoflavones daidzein, genistein, glycitein, and factor-2 is one of their main physiological functions. Antioxidants are substances that can prevent, postpone, or slow down the oxidation of lipids. Antioxidants are substances that can neutralize or lessen the harmful effects of oxidants in the body. The body needs the antioxidants in isoflavones to stop the reaction of free radical generation in order to slow down the aging process and ward off degenerative illnesses like atherosclerosis, coronary heart disease, diabetes mellitus, and cancer. Generally speaking, synthetic antioxidants that are utilized as preservatives in dietary items might be harmful to your health (Suryo and Tohari, 1995). For this reason, it is necessary to find other alternatives to overcome these problems. One way is to replace the use of synthetic antioxidants with natural antioxidants.

Plant foods like nuts are widely available in Indonesia. In Indonesia, peanut (*Arachis hypogaea L.*) is the second-most significant kind of legume after soybean. Unfortunately, there isn't much research that has looked at and used peanuts in the medical field. While having a protein level between 25 and 30 percent, a carbohydrate content between 12 and 15 percent, and an oil content between 40 and 50 percent, peanuts also contain minerals including calcium, chloride, ferrous, magnesium, phosphorus, potassium, and sulfur in addition to vitamins A, B, C, D, and E (Kusumaputri, 2010).

The demand for peanuts rises annually in tandem with Indonesia's population growth, community nutritional requirements, food diversity, and expanding feed and food production capability. In Aceh, particularly in the districts of West Aceh, Pidie, Aceh Jaya, Nagan Raya, Southwest Aceh, and South Aceh, peanuts are one of the main commodities. Paddy fields and dry land are the two types of terrain that farmers typically employ for peanut farming. There are 350,515 Ha and 1,223,983 Ha of paddy fields and dry lands available in Aceh Province, respectively. Aceh Province's average annual yield of peanuts increased from 2013, 2014, and 2015, reaching 955 tons, 1,200 tons, and 1,500 tons, respectively (BPS, 2014).

Plant morphology, physiology, and biochemistry all undergo a complicated series of changes during germination. Enzymes will restructure proteins, carbohydrates, and lipids for usage as building blocks for growth in the vicinity of growing points and as fuel for respiration (Sutopo, 2002). Prior to the development of the embryo, the reserve material is destroyed during germination and used for respiration and the synthesis of new cells. In addition to increasing the grain's lysine level and amylase activity, germination also causes the grain's sugar and essential fatty acid content to increase due to lipase (Chavan and Kadam, 1989). During the germination process, the seeds' nutrient content will alter. This modification in nutrient content can be applied to processed foods as well as to unprocessed foods. According to research by Astawan (2020), the soybean germination process had a significant impact ($p < 0.05$) on the antioxidant activity and isoflavone levels of freshly manufactured tempeh flour. Hayuningtyas *et al.*, (2023) also found that the germination can raise the sprout nutrient, showed by increasing the total antioxidant activity of peanut sprout compared to treatment without germination.

The aim of this study was to investigate the effect of germination time on isoflavone contents of peanut sprouts.

METHOD

Germination process

The peanuts were washed, soaked for 8 hours, and then washed one more and drained to start the germination process. For germination according to treatment (0, 24, 48, and 72 hours), the clean beans were put on trays and covered with fabric. Every 12 hours, the beans were hydrated by misting them with water.

Isoflavone Extraction

Approximately 100 g of sprouts were mixed to make a paste. The sprout paste was then macerated with 250 cc of 70% ethanol. 24 hours later, the filtrate was located. The residue was then given 100 ml of 70% ethanol, which was macerated once more for 24 hours before being filtered and having the filtrate collected. The second residue was given 100 cc of 70% ethanol. The maceration filtrate was concentrated to produce a thick extract using a rotary evaporator. The extract was then dried for 30 minutes at 50°C in the oven.

Isoflavone Identification

Identification of isoflavones was carried out by using the High Performance Liquid Chromatography (HPLC). The sample solution was prepared by taking 1 mg of extract and then each was dissolved in 10 mL ethanol. The solution was then centrifuged and 20µL was taken with an injection device. Then the sample was injected into the HPLC after the HPLC conditioning was complete. Analyzing HPLC chromatograms using standard isoflavone chromatograms including daidzein and genistein. The HPLC conditions are as follows :

Column length	: 10 cm
Column type	: Lichrospher (R) 100 RP-18 (non-polar)
Mobile phase	: methanol:acetic acid 0.02 (57.5% ; 42.5%)
Injection Volume	: 20 µL
Detector	: UV light at a wavelength of 265 nm
Temperature	: room temperature

RESULT

Morphology of Peanut Sprout

One step of plant development that has been extensively researched to raise the nutritional content of materials is germination. Figure 1 depicts the shape of the peanut after germination and demonstrates that the peanut sprouts grew radicles for 24, 48, and 72 hours after germination.

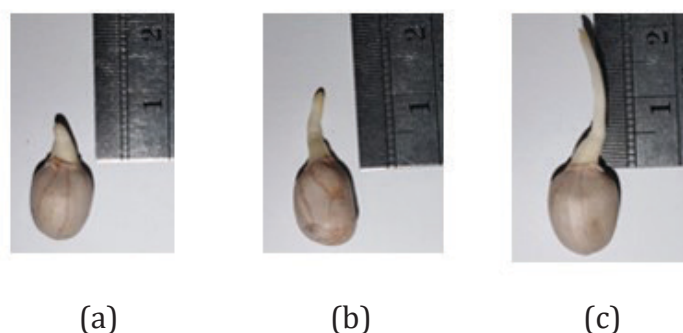


Figure 1. Morphological appearance of peanut sprouts

(a) Germination 24 hours (Length : ± 0.5 cm), (b) Germination 48 hours (Length : ± 1 cm), (c) Germination 72 hours (Length : ± 2 cm)

Isoflavone Content

The following is a table of isoflavones identification results from peanut sprouts with different germination times compared to peanuts without germination as a control.

Table 1. Isoflavones content of peanut sprouts with different germination times

Treatment	Germination time	Isoflavone Content ($\mu\text{g/g}$)		Total ($\mu\text{g/g}$)
		Daidzein	Genistein	
Peanut (non germination)	0 hour	45,22	63,03	108,25
Peanut Sprout	24 hours	42.15	56.74	98,89
	48 hours	43.64	58.53	102,17
	72 hours	42.64	56.29	98,93

Based on table 1. It can be seen that the highest isoflavone content resulted from the treatment of peanut sprouts with a germination time of 48 hours, both daidzein and genistein, followed by 24- and 72-hours treatments.

DISCUSSION

Morphology of Sprout after Germination

Germination is one of the levels in plant development that has been widely studied to increase the nutritional value of ingredients. The morphology of peanuts after germination shown in Figure 1. indicates that radicle growth occurred in peanut sprouts after germination for 24, 48, and 72 hours. This illustrates that after soaking there is a process of overhauling nutrients which causes breakdown which can activate enzymes. According to Zainal (2013), the soaking process before germination results in the formation or activation of enzymes which cause an increase in metabolic activity. The presence of water inside the cells activates a number of enzymes at the start of germination. Therefore the formation of the radicle can occur because the enzymes have been produced.

According to Ferdiawan et al. (2019), the radicle spreads outward through the seed coat during the germination phase. Hydration or imbibition initiates the germination process, which is then followed by enzyme activation, embryo growth, and sprout growth (Shofi, 2017). The pattern of water absorption during the germination process, as described by Walter et al. (2000) in Ferdiawan et al. (2019), happens in three phases: Phase I starts with water absorbing quickly because there may be a difference between water and seeds. Due to the seed's active seed metabolism, the water potential of the surroundings and the seed itself are in equilibrium throughout phase II, which is characterized by slow water absorption. Phase III is marked by swelling up until the radicle breaks through.

Isoflavone Content of Peanut Sprout

Analysis using the HPLC method aimed to identify the presence of isoflavones daidzein and genistein in samples of peanut sprouts with different germination times. As with other chromatographic methods, HPLC analysis was carried out by comparing the retention time of standard isoflavone compounds with the retention time of each sample. The appearance of peaks that have the same relative retention time as the isoflavone standard indicates that the sample contains similar isoflavones.

Based on Table 1, the highest isoflavone content resulted from the treatment of peanut sprouts with a germination time of 48 hours, both daidzein and genistein, followed by 24- and 72-hours treatments. According to Istiani (2010) the presence of isoflavones is caused by the process of hydrolysis into isoflavone aglycones and their glucose during germination, peanuts still contain water even though they have not undergone processing. However, when compared with the treatment without germination (control) the results obtained were higher for both isoflavone standards. This is because the standards used in the analysis are only daidzein and genistein, while during the germination process isoflavones can be converted into other forms of flavonoids that are not tested in the analysis. According to Zhu et al. (2005), during germination there was an increase in the isoflavones daidzein, genistein, malonildaidzein, and acetyldaidzein. Where the highest increase occurred in malonyl deidzein. The observed increase and decrease in isoflavone content can also be caused by the conversion of other flavonoids into isoflavones or isoflavones into other flavonoid compounds. Therefore, a critical future research with the addition of other isoflavone standard variations needs to be carried out.

CONCLUSION AND RECOMMENDATION

Conclusion

Germination of peanuts carried out at intervals of 24, 48, and 72 hours resulted in peanut sprouts with an average growth of 0.5 cm, 1 cm, and 2 cm respectively. Compared to other germination time treatment, peanut sprouts with 48 hours of germination can optimally increase the isoflavone content of peanut sprouts (88.24%). However, it is found that the treatment without germination obtained higher isoflavone content compared to those with germination treatment for both standards. This result may be due to during the germination process isoflavones can be converted into other forms of flavonoids that are not tested in the analysis.

Recommendation

Researchers suggest a critical future research that could study the other conversion form of isoflavone of peanuts during germination.

ACKNOWLEDGEMENT

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THE RELATIONSHIP BETWEEN FOOD INSECURITY AND CARDIOVASCULAR DISEASE RISK FACTORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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ABSTRACT

Background The correlations between food security and risk factors for cardiovascular disease, such as smoking, obesity, or overweight, are poorly understood. **Purpose:** This study aimed to identify the relationship between food insecurity and cardiovascular disease risk factors. **Method:** Through internet databases including EBSCO, Medline, PubMed, etc., this meta-analysis looked for observational studies published in English from 2000 to 2022 that focused on the relationship between obesity and food insecurity in the general population and smoking and tobacco use. Independently, two review writers chose which research to include, collected the data, and determined whether the included studies were biased. **Results:** The pooled analysis was carried out using software review manager (RevMan) 5.3. Pooled analysis indicated that people with food insecurity had higher odds of smoking (AOR= 1.75; 95%CI= 1.50-2.0; $p<0.00001$) and, or having high BMI (AOR= 1.22; 95%CI= 1.11-1.35; $p<0.0001$) than those who did not smoke or with normal BMI, respectively and both of these results were statistically significant. **Conclusion:** Those who experienced food insecurity were more likely to smoke, have a high BMI, or both than those who did not smoke or had a normal BMI. In order to provide useful information on the situational environment that is related to the association between food insecurity, smoking behavior, and high BMI level, additional experimental or observational studies of programs to mitigate food insecurity, as well as data collection on recent tobacco initiators or quitters, and addition data of people with obesity or overweight, are needed.

Key words: cardiovascular disease, food insecurity, obesity, smoking

INTRODUCTION

Cardiovascular disease (CVD) is the main cause of death worldwide (Ke & Ford-Jones, 2015) with millions of Canadians experiencing some level of food insecurity. The purpose of the present article is to review what is currently known about the effects of food insecurity and hunger on children. Longitudinal studies in Canada indicate that hunger is related to poor health outcomes, including a higher risk of depression and suicidal ideation in adolescents, and chronic conditions, particularly asthma. In addition, nutrient deficiencies, such as iron deficiency are known to impair learning and cause decreased productivity in school-age children and maternal depressive disorders. School-based nutrition programs and innovations, such as subsidized food (apples, cheese, soy nuts, carrots and broccoli). A 2021 literature review conducted by Liu and colleagues, which included 14 studies of adults over 17 years of age, identified an unequal burden of CVD risk among individuals with the lowest food security levels (Sun et al., 2020). In his observation in 2020, Sun and colleagues also observed individuals with very low food security had a higher risk of CVD mortality (HR=1.53, 95% CI, 1.04–2.26) when compared with those with high food security from participants in the US National Health and Nutrition Examination Survey from 1999–2014 (Sun et al., 2020). Hypertension, Diabetes Mellitus, dyslipidemia, obesity, smoking, and age, are the most frequent risk factors for the occurrence of cardiovascular diseases. All of these factors are also involved in the development and progression of atherosclerosis (Fung et al., 2016) there are few diet quality assessment tools that are predictive of coronary artery disease (CAD)

As another sign of socioeconomic distress, food insecurity has recently been connected to cardiovascular disease risk factors and other consequences (Ford, 2013) (Palakshappa et al., 2021) the pathways by which FI leads to worse cardiovascular health are unknown. We tested the hypothesis that FI is associated with ASCVD risk through nutritional/anthropometric (eg, worse diet quality and increased weight (Hassan, 2017). Food insecurity affects 2 billion people worldwide and is a serious public health issue (Liu & Eicher-Miller, 2021). It has been suggested in the past that household food poverty encourages reliance on low-cost, extremely appealing, and energy-dense foods. A short time later, such dependence plus the cyclical nature of food abundance at the beginning of the month and shortage at the end of the month could result in weight increase. Such a reliance on foods high in energy and weight increase may directly contribute to the emergence of chronic illnesses. (Laraia, 2012)

Ranges are defined by the classification of food security; in the most severe level, very poor food security (VLFS), there is less food available and eating habits are altered. Low food security (LFS) refers to a range where there is little to no food but a lower quality or diversity of food. In low food security (LFS), there is worry about running out of food, but there are no dietary adjustments, and in high food security (HFS), there are no signs of restrictions on food access (Laraia, 2012)

Although there have been several reviews on the influence of food insecurity on various health outcomes to date, there have been few comprehensive systematic reviews in this area (Gundersen & Ziliak, 2015) (Compton, 2014; Gundersen & Ziliak, 2015; Weaver et al., 2018). Previous reviews had methodological limitations, including absent subgroup data and individual/group bias analyses. Furthermore, there hasn't been any review that addresses the association between food insecurity and the risk of cardiovascular disease. Therefore, the purpose of this meta-analysis is to determine the relationship between food insecurity and select cardiovascular disease risk factors.

METHOD

This systematic review was conducted according to the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guidelines. An electronic search of EBSCO, Medline, and PubMed was conducted from their inception to 31st October 2022 with only English language-based literature using the search string: (food insecurity) AND (cardiovascular disease OR heart disease) AND (risk factors). In addition, This systematic review included comparative studies. This is defined as RCTs, non-RCTs, and observational studies that used a comparison group. The broad inclusion criteria ensured all studies investigate the relationship between food insecurity and with risk of cardiovascular disease. The articles that were published between January 1, 2000, and August 31, 2022, were included. Our search strategy is shown in Figure 1 with a diagram of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher et al., 2009). Analyses were performed following the guidelines proposed by PRISMA.

All studies were included if they met the following eligibility criteria: (a) articles about the relation of food insecurity with the risk of cardiovascular disease; (b) observational studies; (c) we conclude all general population. Furthermore, the strategy for research was PECOS: 1) P (population): general adult; 2) E (exposure): low food security or food insecurity; 3) C (control): high food security; 4) O (outcome): cardiovascular risk such as high BMI and smoking; 5) S (Studies): all design of studies published in English only.

Observational studies such as cross-sectional, case-control, and cohort studies conducted on the general population with or without any prior diseases were included in the study. A population of all ages was included in the search. Studies using multivariate logistic regression with an adjusted odd ratio as an effect estimate were included. Qualitative studies, commentaries, letters, and editorials were also excluded as well as conference abstracts, articles without the full text, and non-English reports and papers. Figure 1 shows the process to exclude unrelated articles.

Based on the inclusion and exclusion criteria used during the primary screening, two authors independently reviewed the title and abstract of studies collected during the search phase. Studies that did not meet the eligibility criteria were eliminated at this stage. During the secondary screening, the full texts of these articles were reviewed for inclusion criteria. Data from each of the included studies were then extracted and summarized in table 1.

The quality of the included studies was evaluated independently by three reviewers. To assess the quality of observational studies, the Newcastle-Ottawa Scale checklist was used. Articles were considered high quality if their total score was 7, fair or good if their score was between 5 and 7, and poor if their score was less than 5.

Review Manager version 5.3 (RevMan) was used for all statistical analyses to determine the proportion/frequency of smoking and high BMI. This is version 5.3. The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen, 2014. The random effect model was used because there appeared to be heterogeneity. The Q and I² statistic tests were used to assess study heterogeneity. P 0.05 was considered statistically significant for the Q test, and I² values of 75%, 50%, and 25%, respectively, were considered evidence of high, moderate, and low levels of heterogeneity.

RESULT

Fourteen studies were included in this systematic review and meta-analysis (Armour et al., 2008; Brostow et al., 2017; Cutler-Triggs et al., 2008; Fitzgerald et al., 2011; Hamed-Shahraki et al., 2021; Jih et al., 2018; Kang & Cho, 2022; Mendy et al., 2018; Nagata et al., 2019; Robson et al., 2017; Tolzman et al., 2014; Tong et al., 2019; Vercammen et al., 2019; Widome et al., 2015).

Of them, 1 study was done in Iran(Hamed-Shahraki et al., 2021), 1 in South Korea(Kang & Cho, 2022), and 12 in the USA(Vercammen et al., 2019)(Arenas et al., 2019)(Cutler-Triggs et al., 2008)(Fitzgerald et al., 2011); Jih et al., 2018; Mendy et al., 2018; Nagata et al., 2019; Robson et al., 2017; Tolzman et al., 2014; Tong et al., 2019; Vercammen et al., 2019; Widome et al., 2015).

Based on the study design used 11 studies were done by cross-sectional study design and 1 was done by case-control study design (Fitzgerald et al., 2011). The articles were published between 2008 and 2022.

The total number of participants in the included studies ranged from 201 to 495,509 (Table 1).

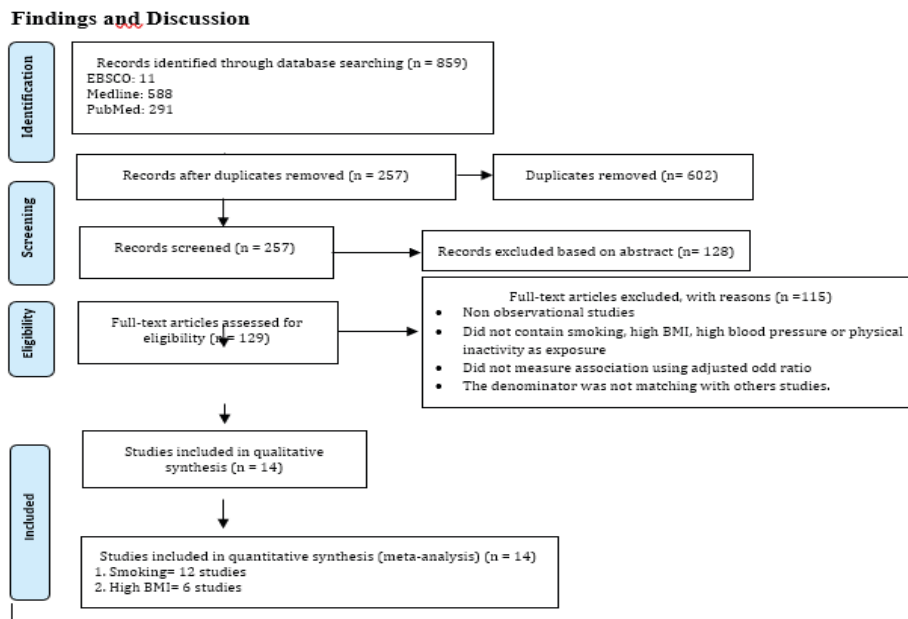


Figure 1. PRISMA Diagram Chart

The association between food insecurity and smoking

We found that 12 studies reported an association between food insecurity and smoking. Subgroup analysis using random-effects model analysis was found to be AOR 1.75 (95%CI= 1.50-2.04); $I^2 = 58\%$; $p < 0.00001$ (Figure 2). The category of food insecurity (general as without further specification of the criteria, low or moderate, and, very low or severe) was used as criteria of subgroup analysis.

Table 1 Risk of bias assessment (Newcastle–Ottawa Quality Assessment Scale criteria).

Studies	Selection			Ascertainment of the exposure (risk factor)	Comparability	Outcome		Quality
	Representativeness of the sample	Sample size	Non respondents		Comparability of subjects in different outcome groups based on design or analysis. Confounding factors controlled	Assessment of outcome	Statistical test	
Armour et al., (2008)	1	1	0	1	2	1	1	Good
Brostow et al., (2017)	1	1	0	1	2	1	1	Good
Cutler-Triggs et al., (2008)	1	1	0	1	2	1	1	Good
Fitzgerald et al., (2011)	1	1	0	1	2	1	1	Good
Hamedi-Shahraki et al., (2020)	1	1	0	1	2	1	1	Good
Jih et al., (2019)	1	1	0	1	2	1	1	Good
Kang & Cho, 2022	1	1	0	1	2	1	1	Good
Mendy et al., (2015)	1	1	0	1	2	1	1	Good
Nagata et al., (2019)	1	1	0	1	2	1	1	Good
Robson et al., (2017)	1	1	0	1	2	1	1	Good

Table 2 Study characteristics and results.

No.	Author	Method	Country	Sample (age)	Risk Factors	Control	AOR; 95% CI
1.	Armour et al., (2008)	Cross-sectional	USA	2,099 (all ages)	Smoking	No smoking	1.44 (1.14-1.82)
2.	Brostow et al., (2017)	Cross-sectional	USA	1,254 (aged ≥50 years)	Smoking	No smoking	2.24 (0.99, 5.07)
3.	Cutler-Triggs et al., (2008)	Cross-sectional	USA	8,817 (aged 0-17)	Smoking	No smoking	Low 2.2 (1.6-3.0); Very Low 2.3 (1.4-3.7)
4.	Fitzgerald et al., (2011)	Case-control	USA	201 (aged 35–60 years)	Smoking	No smoking	Low 1.25 (0.55–2.88); Very Low 3.74 (1.50–9.30)
5.	Hamedi-Shahraki et al., (2020)	Cross-sectional	Iran	630 women (aged 18–50)	High BMI	Normal BMI	Moderate 2.09 (1.10-3.98); Severe 2.43 (1.09–5.40)

6.	Jih et al., (2019)	Cross-sectional	USA	3552 (aged ≥50 years)	Smoking High BMI	No smoking Normal BMI	1.17 (0.83–1.66) 1.13 (0.88–1.45)
7.	Kang & Cho, 2022	Cross-sectional	South Korea	21,063 (aged > 19 years)	Smoking	No smoking	Moderate 1.48 (0.84–2.58); Severe 7.82 (2.11–28.94)
8.	Mendy et al., (2015)	Cross-sectional	USA	5,870 (aged ≥18 years)	High BMI Smoking	Normal BMI No smoking	1.68 (1.28–2.21); 1.82 (1.40–2.37)
9.	Nagata et al., (2019)	Cross-sectional	USA	14,786 (aged 24–32 years)	High BMI	Normal BMI	1.12 (0.97–1.29)
10.	Robson et al., (2017)	Cross-sectional	USA	495,509 (aged >12 years)	High BMI Smoking	Normal BMI No smoking	1.18 (0.92–1.52); 1.81 (1.32–2.49)
11.	Tolzman et al., (2014)	Cross-sectional	USA	5,006 (aged ≥18 years)	Smoking	No smoking	3.60 (1.72-7.54)
12.	Tong et al., (2018)	Cross-sectional	USA	350(aged ≥50)	Smoking	No smoking	Very Low 0.67 (0.36–1.25)
13.	Vercammen et al., (2019)	Cross-sectional	USA	13,518 (aged 20–64)	High BMI Smoking	Normal BMI No smoking	Low 0.97 (0.34-1.60); Very Low 1.03 (0.44-1.63). Low 1.47 (1.22-1.77); Very Low 1.95 (1.60-2.37).
14.	Widome et al., (2014)	Cross-sectional	USA	2,000	Smoking	No smoking	Low 1.61 (0.98-2.65); Very Low 2.28 (1.29-4.03)

Publication bias

Subjectively the funnel plot indicated asymmetrical distributions which indicate the publication bias (Figure 5).

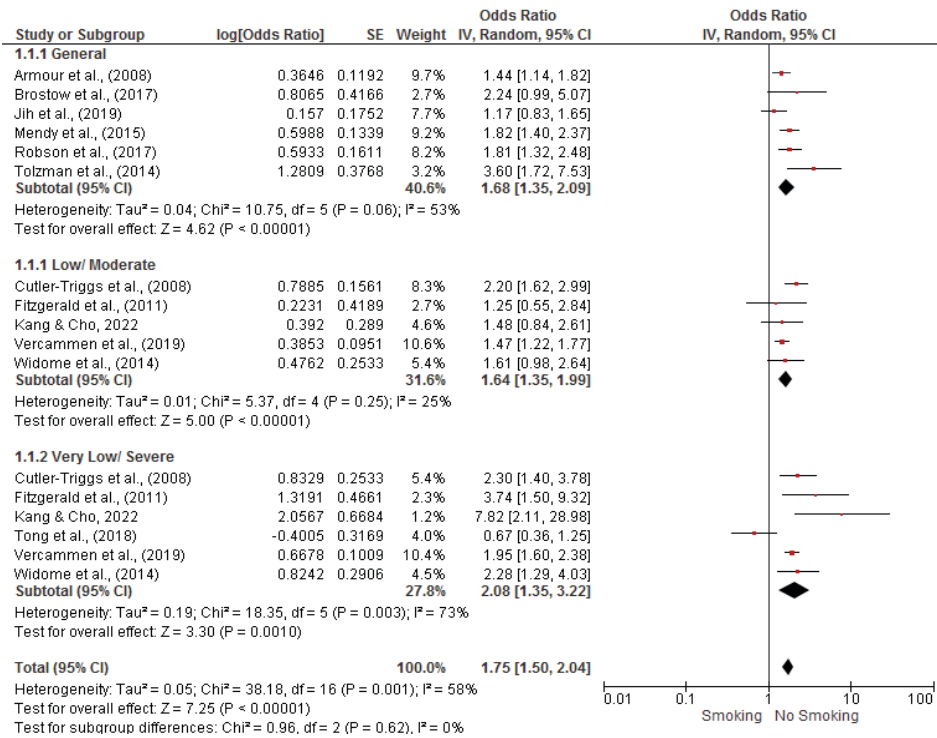


Figure 2. forest plot of the association between food insecurity and smoking

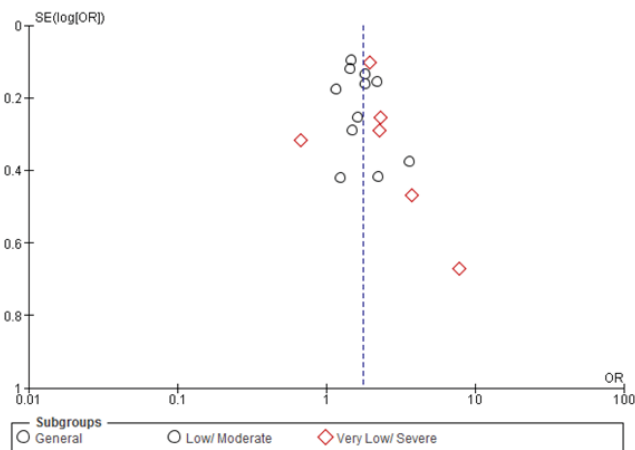


Figure 3. funnel plot of the association between food insecurity and smoking

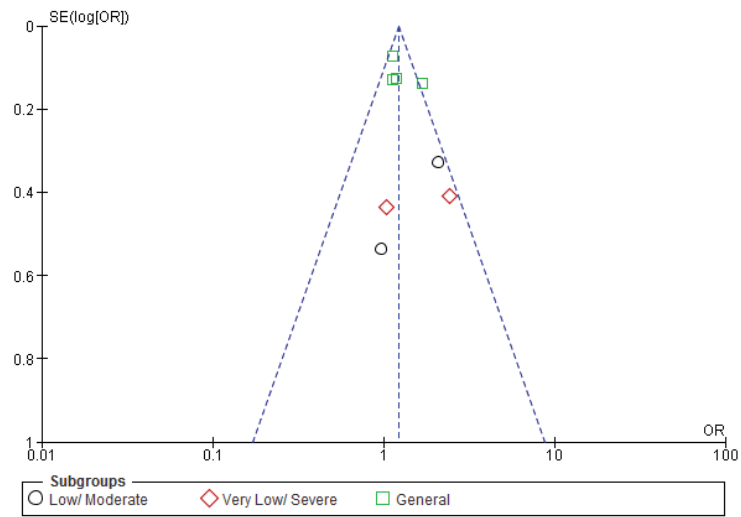
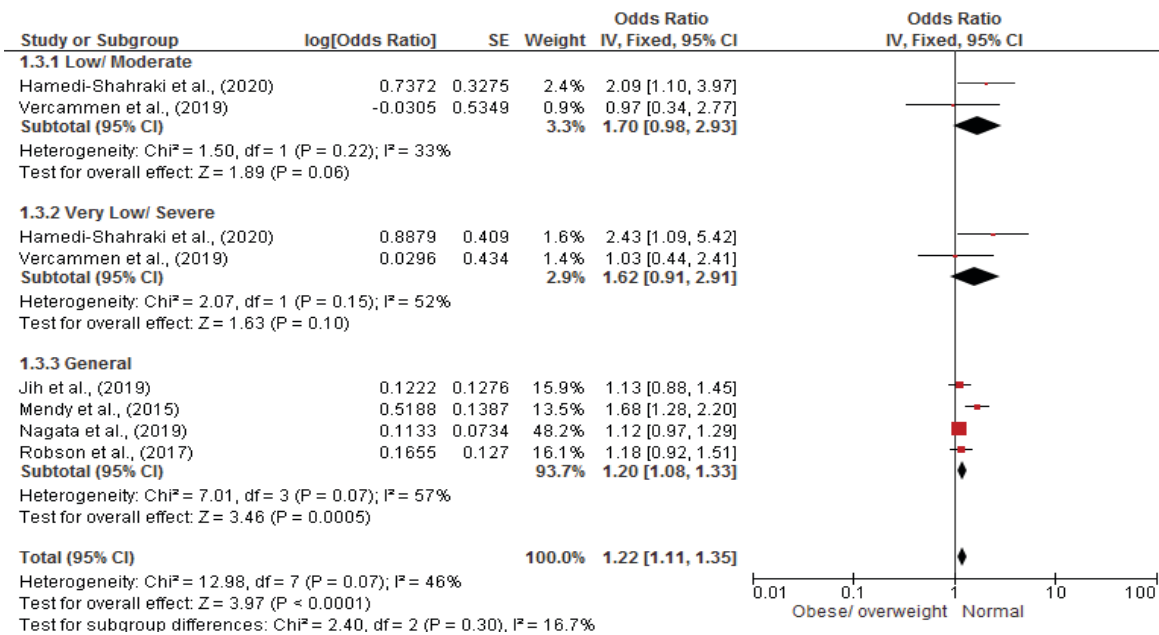


Figure 5. funnel plot of the association between food insecurity and high BMI

DISCUSSION

According to our data, cardiovascular disease risk factors like smoking and a high BMI (fat or overweight) are linked to food insecurity at all levels. Even after controlling for wealth, Sheira et al. (2021), who found that persons who were food insecure were 16–21% more likely to smoke than those who were not, supported this link (Sheira et al., 2021). Through two processes, increased smoking intensity may be influenced by food insecurity. According to Whittle et al. (2019), food insecurity is a major stressor that can result in poor mental health (Whittle et al., 2019), which is linked to smoking (Prochaska, 2011; Taylor et al., 2014) Cochrane Central Register of Controlled Trials, Medline, Embase, and PsycINFO for relevant studies from inception to April 2012. Reference lists of included studies were hand searched, and authors were contacted when insufficient data were reported. ELIGIBILITY CRITERIA FOR SELECTING STUDIES: Longitudinal studies of adults that assessed mental health before smoking cessation and at least six weeks after cessation or baseline in

healthy and clinical populations. RESULTS: 26 studies that assessed mental health with questionnaires designed to measure anxiety, depression, mixed anxiety and depression, psychological quality of life, positive affect, and stress were included. Follow-up mental health scores were measured between seven weeks and nine years after baseline. Anxiety, depression, mixed anxiety and depression, and stress significantly decreased between baseline and follow-up in quitters compared with continuing smokers: the standardised mean differences (95% confidence intervals. Second, those with food insecurity may smoke to deal with hunger because tobacco suppresses appetite via the hypothalamus (Frankish et al., 1995; Miyata et al., 1999).

Food insecurity may drive higher smoking intensity through two mechanisms. First, food insecurity is a profound stressor that leads to poor mental health which in turn is associated with cigarette smoking. Second, tobacco acts as an appetite suppressant via the hypothalamus and food-insecure individuals may smoke to cope with hunger.

Furthermore, smoking, lipid abnormalities, and high blood pressure are recognized risk factors for cardiovascular disease, according to Keto et al.'s (2016) explanation (Keto et al., 2016). Smoking has typically been linked to numerous other risk factors, such as a worse lipid profile and higher blood pressure, in addition to being an individual risk factor for cardiovascular disease. According to earlier studies, smokers have lower levels of HDLs and greater levels of triglycerides, LDLs, and serum cholesterol than non-smokers (Green & Harari, 1995; Jousilahti et al., 1996; Maeda et al., 2003). Although they can be broken down into multiple systemic pathways, the mechanisms behind cigarette smoke-induced atherosclerosis, arterial thrombosis, and its clinical manifestations as CVD are still partially understood. First, cardiac remodeling brought on by reactive oxygen species, such as left ventricular hypertrophy and atrial fibrosis, raises the risk of stroke. Systemic oxygen free radicals that produce oxidative stress lead to systemic and local inflammation, which is manifested by an increase in peripheral leucocytes and C reactive protein levels as well as other proinflammatory cytokines that encourage arterial (Varela-Carver et al., 2010) and has deleterious effects in, ischaemic heart disease. Exposure to CS increases infarct size in experimental models of coronary occlusion and reperfusion. Among many possible mechanisms for these deleterious effects in intact animals and humans three have more substantial evidence: 1. Second, the release of chemicals from the adrenal medulla in response to nicotine alters cardiac output by raising blood pressure, heart rate, and ventricular contractility, which may cause myocardial ischemia (Benowitz, 2003; Libby et al., 2002). Third, compounds in cigarette smoke expose smokers to myocardial ischemia by causing deficient vasomotor functions, which is seen as thickening of the arterial wall and intima-media, reduced ability to expand and contract vessels, as well as increased arterial stenosis (Michael Pittilo, 2000; Rahman & Laher, 2007).

Body mass index (BMI) and food insecurity have a complicated association that changes depending on the community and study (Franklin et al., 2012; Larson & Story, 2011). For those who are often food insecure, during periods of adequate food availability there may be overconsumption of high calorie, energy dense foods, which can result in metabolic changes, such as insulin resistance, that predispose individuals to obesity (Drewnowski & Darmon, 2005) (Drewnowski & Darmon, 2005; National Task Force on the Prevention and Treatment of Obesity, 1994). In a study in the general population in California, obesity was more prevalent among women who experienced food insecurity with hunger as compared to food secure women (35.2% vs. 16.2%, $P < 0.05$) (Adams et al., 2003). Household food insecurity may increase consumption of highly palatable foods through a stress-mediated pathway and/or through an economic dependence on

inexpensive, calorie dense foods. Household food insecurity was previously found to be associated with several measures of psychosocial factors (Laraia et al., 2006). When access to food is limited, it is hypothesized that women may rely on less expensive foods that are nutrient poor and calorie-rich (Drewnowski & Darmon, 2005); several studies have further speculated that early life exposure to household food insecurity may drive long term weight gain trajectories throughout life—possibly by food hoarding or dependence on high calorie dense foods (Allen & Wilson, 2005; Kaiser et al., 2004). A previous study found that increased pregravid BMI was associated with poor diet quality (Laraia et al., 2007). It is also possible that stress may synergize with the specific effect of household food insecurity on food selection, since eating highly palatable, highly gratifying but low quality foods can also be a response to stress (Adam & Epel, 2007). If exposure to household food insecurity mainly influences women’s eating behaviors by increasing intake of highly palatable, high calorie dense foods, then one would expect higher gestational weight gains. Additionally, household food insecurity may be associated with decreased physical activity, although no research studies were identified to support this hypothesis. Decreased physical activity may be associated with household food insecurity status if decreased calorie consumption leads to an energy conservation state, however, MET hours/week was used in the model as a covariate and did not attenuate the association between household food insecurity and any outcome (Borodulin et al., 2008).

In addition, obesity is also known to contribute to the absolute risk of cardiovascular disease (Jousilahti et al., 1996). Obesity was associated with shorter longevity and significantly increased risk of cardiovascular morbidity and mortality compared with normal BMI. Despite similar longevity compared with normal BMI, overweight was associated with significantly increased risk of developing cardiovascular disease at an earlier age, resulting in a greater proportion of life lived with cardiovascular disease morbidity (Khan et al., 2018). Obesity is characterized by chronic low-grade inflammation and dysregulation of the endocrine and immune milieu in the adipose tissue. Aberrant production of adipokines and inflammatory molecules have been associated with the genesis of CVD (Kahn et al., 2019).

Food insecurity prevalence has been rising worldwide, being especially prominent among low-income households with children, racial/ethnic minorities, and single mothers. Notably, food insecurity is associated with various cardiovascular risk factors – such as obesity and smoking. To improve access to healthy foods and attenuate increased cardiovascular risk, federal aid programs should provide subsidies and other financial incentives to purchase fruits and vegetables. These actions would require greater investment from the federal government to fund and increase access to such initiatives. Partnerships among public assistance programs, healthcare systems, and community organizations can further improve food access and patients’ understanding of nutrition. More longitudinal population-wide studies are also needed to assess the causal relationship between food insecurity and cardiovascular disease, as well as the efficacy of the aforementioned interventions. Future collaboration among researchers, policymakers, and clinicians may lay the groundwork for improving access to nutritious food and, ultimately, cardiovascular health (Chang et al., 2022).

CONCLUSION AND RECOMMENDATION

Conclusion

In conclusion, food insecurity was associated with known cardiovascular diseases risk such as being a smoker or obese, or overweight. This relationship under scores the importance of integrating food security alleviation programs with smoking cessation programming.

Recomendation

Furthermore, to better identify those at risk for tobacco use initiation as well as design and enhance policies and programs to simultaneously reduce food insecurity and promote smoking cessation, we need more experimental or observational such as cohort, case-control, or cross sectionals studies of programs to alleviate food insecurity and should collect data on recent tobacco initiators or quitters to provide valuable information on the contextual milieu that is related to smoking initiation, duration, intensity, and cessation. Also, it is clear that food insecurity has spiked during the COVID-19 pandemic, and given ongoing downstream effects from levels of unemployment, this vulnerability will continue for some time. In light of this, strategies to mitigate food insecurity and obesity will benefit from mutual consideration and the focus of further work could be shifted to elucidate other risk factors as well as the mechanisms behind the complex relationship between food insecurity and obesity among general population.

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THE EFFECTIVENESS OF GIVING CUCUMBER JUICE IN REDUCE BLOOD PRESSURE IN ELDERLY SUFFERING FROM HYPERTENSION: LITERATURE STUDY

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ABSTRACT

Background : When systolic blood pressure exceeds 140 mmHg and diastolic blood pressure exceeds 90 mmHg, it is known as hypertension. Symptoms of hypertension include headaches, blurred vision, irritability, difficulty sleeping, chest pain, dizziness, and a rapid heartbeat. Natural resources are used in non-pharmacological therapy to decrease blood pressure, including fiber-rich, vitamin and mineral-rich fruits and vegetables. Cucumber has a variety of nutrients, including water, vitamin A, vitamin k, potassium, magnesium, and salt, and is low in calories, fat, sodium, and cholesterol. **Purpose:** To determine the benefits of cucumber juice therapy in lowering blood pressure. **Method:** Literature study using search engine databases namely Scencedirect, Pubmed, and Google Scholar, with article publications ranging from 2019-2023. keywords included: "Juice" OR "Cucumber Juice" OR "Cucumber" AND "Hypertension" OR "Blood Pressure" OR "Systole Dyastole" AND "Elderly" AND "Randomized Control" OR "Clinical trials". which discusses the effectiveness of cucumber juice in lowering blood pressure. **Result:** Cucumber juice therapy is effective in lowering blood pressure in hypertensive patients found 8 journals that discuss the effectiveness of cucumber juice in lowering blood pressure. **Conclusion:** cucumber juice therapy is effective in reducing blood pressure in hypertensive patients

Key words: Cucumber Juice, Hypertension, Elderly

INTRODUCTION

When systolic and diastolic blood pressure exceed 140 and 90 mmHg, respectively, hypertension is present. Symptoms of hypertension include headaches, blurred vision, irritability, difficulty sleeping, chest pain, dizziness, and a rapid heartbeat (Lo et al. 2018). enetics, age, gender, ethnicity, stress, obesity, salt intake, and smoking behaviors are all

risk factors for hypertension (Diener and Hankey 2020). It runs in families or is inherited. People who have a family history of hypertension are two times more likely to develop hypertension than people without a history of the condition. (Sagala and Simatupang 2019). Males are more likely to develop hypertension earlier than females, and the prevalence of hypertension rises with age. Hypertension can become more common as a result of obesity. The cause is that fat has the potential to obstruct blood arteries, raising blood pressure. High salt intake will result in excessive natriuretic hormone secretion, which will afterwards raise blood pressure. Despite the fact that the exact cause of hypertension is unknown, smoking increases the likelihood of developing it. (Moventhan et al. 2021).

Pharmacological and non-pharmacological treatments are both options for treating hypertension in general. Pharmacological therapy is therapy that lowers blood pressure by employing antihypertensive medications. By adopting a better lifestyle and reducing risk factors, non-pharmacological treatment refers to medical care without the use of medications (Armaita et al. 2021). The goal of non-pharmacological treatment is to alter daily habits. Natural resources, such as fruits and vegetables high in fiber, vitamin- and mineral-rich fruits and vegetables, can be used in non-pharmacological therapy to decrease blood pressure. (Mallick 2022). Celery, cucumber, chayote, watercress, radishes, tomatoes, starfruit, sweet starfruit, watermelon, carrots, bananas, apples, and kiwi are among the foods that are effective at lowering high blood pressure. (Siti Fadlilah, Adi Sucipto, and Mohamad Judha 2020)

The Cucurbitaceae family, which includes the extensively farmed cucumber (*Cucumis sativus* L.), is known for its edible fruit. The bitter melon and pumpkin are also included in this family of melons (Evania et al. 2022). In addition to being high in nutrients, cucumbers are also low in calories, fat, salt, and cholesterol. They include water, vitamin A, vitamin K, potassium, magnesium, and potassium among these nutrients. (Chalida et al. 2019). Cucumbers contain a lot of water, which can keep us hydrated. Additionally, fiber helps us maintain regularity and prevent constipation. Both blood clotting and bone health are supported by vitamin K. Numerous advantages of vitamin A include support for the immune system, reproduction, and vision. Additionally, it guarantees the appropriate operation of our heart, lungs, and kidneys (Kongkoli and Askar 2021). Magnesium, potassium, and vitamin K are all present in cucumbers. For the cardiovascular system to operate properly, these three nutrients are crucial. Blood pressure can be lowered by potassium and magnesium (Winata, Indrayani, and Carolin 2020).

METHOD

1. Method

Researchers conducted a descriptive narrative analysis of some of the key findings from research papers to conduct a literature review on the effectiveness of health education and cucumber juice in decreasing blood pressure in elderly people with hypertension. When evaluating and choosing research publications, the author follows the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) standard. The PRISMA guideline is a type of tool that consists of flowcharts and 27 checklist items to help writers improve the quality of selecting research papers in a methodical manner.

2. Eligibility criteria

The researcher used the PICO(S) standard in determining the eligibility criteria for the journals being reviewed. Journals that are worthy of review have criteria as in table 1.

Table 1. Inclusion Criteria

Standard	Criteria
Problem	Hypertension Patients, Elderly
Intervention	Cucumber juice therapy
Control	Patients who were not given cucumber juice therapy
Outcomes	Decreased blood pressure after being given cucumber juice
Study design	Quasi experiment

3. Resources

The source of the article that will be used in this Literature Review uses search engine databases, namely Sciencedirect, Pubmed, and Google Scholar, with article publications ranging from 2019-2023.

4. Search Strategy

The literature search strategy involves keywords related to the topic and title of the study using standard Boolean operators "AND" and "OR". keywords included: "Juice" OR "Cucumber Juice" OR "Cucumber" AND "Hypertension" OR "Blood Pressure" OR "Systole Dyastole" AND "Elderly" AND "Randomized Control" OR "Clinical trials".

5. Article Selection

The PRISMA diagram, which has four steps, is used in the article selection procedure (Figure 1). The author counts the number of articles from all database searches during the identification stage. The second step is screening, where the author chooses an article based on its title and abstract. Articles that matched the requirements for inclusion were kept, while those that did not were removed. The authors choose which full-text papers to use in the third stage, which is called feasibility. Articles that matched the requirements for inclusion were kept, while those that did not were removed. Additionally, the methodological quality of publications that have undergone full text review and meet the inclusion requirements is evaluated. In the fourth stage, articles that are relevant to the research topic and title are systematically reviewed

All articles from search results are exported to Mendeley's bibliography program for simple data management and analyzing abstract titles. The following stage is to extract the data collected independently from each study in accordance with the criteria in this literature review when this procedure is complete and research results that meet the criteria are received.

RESULTS

1. Article Selection

Based on the search results for journals according to the keywords that have been determined, 228 journals were obtained, then screening was carried out and 158 journals were duplicated. Furthermore, the researchers conducted a screening based on the title and abstract and obtained 8 journals that matched the inclusion criteria so that 62 journals were excluded. Then a feasibility assessment was carried out using the PRISMA I method with the result that there were 8 journals worthy of review.

2. Extraction Result Data

The data obtained from the articles that passed the selection through the PRISMA diagram consisted of the title, author's name, year the article was published, country of research, research design, method used, and research results (Table 2).

Table 2. Journal Synthesis Results

No	Title, Author	Year	Research Design, Number of Samples	Method	Results
1.	<i>Giving Cucumber Juice to Lower Blood Pressure in Patients with Hypertension at Sarudik Health Center(Sagala and Simatupang 2019)</i>	2020	Quasi Experiment, 20 hypertensive patients	Given cucumber juice therapy for 2 times a day in 1 month	There is a positive impact in giving cucumber juice to reduce systolic and diastolic blood pressure
2.	<i>The Effect Of Giving Ginger Extract And Cucumber Juice On Changes In Blood Pressure In Hypertensive Patients In The Working Region Of Kassi-Kassi Health Center Makassar City (Lumban Siantar, Mentalina Simanjuntak, and Aritonang 2021)</i>	2021	Quasi Experiment, 46 hypertensive patients	Given cucumber juice therapy and ginger extract	Consumption of cucumber juice and ginger extract can help reduce blood pressure in hypertensive patients
3.	<i>Effect Of Cucumber Juice And Brisk Walking Exercise On Blood Pressure In Elderly Hypertension Patients(Chalida et al. 2019)</i>	2019	Quasi Experiment, 40 hypertensive patients	The first group was given cucumber juice therapy for 7 days. And the second group was given brisk walking exercise therapy	Cucumber juice intervention was more effective than brisk walking exercise in reducing blood pressure in elderly hypertensive patients

No	Title, Author	Year	Research Design, Number of Samples	Method	Results
4.	<i>Cucumber (Cucumis sativus) and tomato (Solanum lycopersicum) juices are effective in reducing blood pressure</i> (Siti Fadlilah et al. 2020)	2020	Quasi Experiment, 36 hypertensive patients	Done provision of cucumber juice and tomato juice	Administering cucumber juice and tomato juice effectively helps lower systolic and diastolic blood pressure. But there is no difference in effectiveness between cucumber juice and tomato juice.
5.	<i>The Effect of Cucumber Juice on the Elderly Hypertension in Citalahab Village, Pandeglang District in 2020</i> (Winata et al. 2020)	2020	Quasi Experiment, 34 hypertensive patients	Administered cucumber juice to hypertensive patients	The results showed that there were differences in blood pressure in hypertensive patients before and after consuming cucumber juice in the intervention group
6.	<i>The Effectiveness of Cucumber (Cucumis Sativus) and Ambon Banana Fruit (Musa Acuminata Cola) in Reducing Blood Pressure in Hypertensive Patients in Palangga Gowa District, Indonesia</i> (Kongkoli and Askar 2021)	2021	Quasi Experiment, 24 hypertensive patients	Each was given treatment in the form of giving 2 Ambon bananas per day to the first group while the second group was given 1 portion of cucumber juice as much as 50 grams per day	Cucumbers and bananas are effective for lowering blood pressure.

No	Title, Author	Year	Research Design, Number of Samples	Method	Results
7.	<i>Comparison Efficiency of Consuming Sweet Star Fruit Juice, Carrot Juice and Cucumber Juice against Patients with Hypertension Analyzed with Kruskal Wallis (Silalahi et al. 2020)</i>	2020	Quasi Experiment, 54 hypertensive patients	This study used 3 groups of juice therapy samples, namely the first group of 18 samples used starfruit juice, secondly Comparison of Efficiency of Consumption of Sweet Carambola Juice, Carrot Juice and Cucumber Juice for Hypertension Patients analyzed with Kruskal Wallis the second group of 18 samples used carrot juice, and the third group the third 18 samples using cucumber juice.	Sweet starfruit juice is more effective in lowering blood pressure in people with hypertension compared to carrot juice and cucumber juice.
8.	<i>The Effect of Cucumber Juice on Blood Pressure in Hypertension Patients in the West Pauh Community, Pariaman Health Center Working Area in 2021 (Armaita et al. 2021)</i>	2021	Quasi Experiment, 36 hypertensive patients	Administration of 250 ml of cucumber juice to hypertensive patients	There was a significant change in blood pressure before and after being given 250 ml cucumber juice therapy in the hypertension treatment group

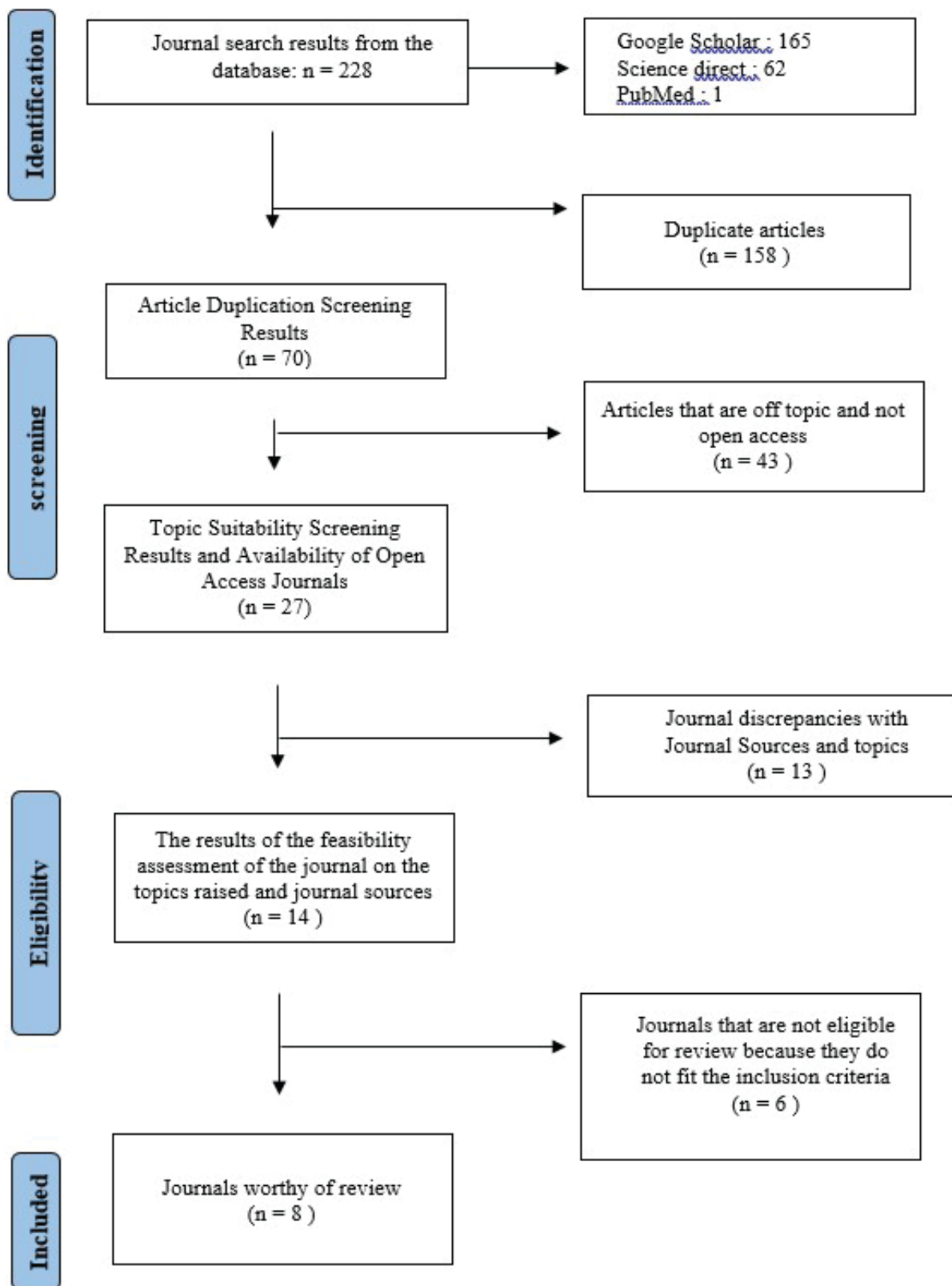


Figure 1. PRISMA Flow Diagram

Table 3. Decreased Blood Pressure After Consuming Cucumber Juice

Writer	Amount	Time	Before (mmHg)		After (mmHg)	
			systolic	Diastolic	systolic	Diastolic
<i>Sagala and Simatupang (2019)</i>	-	2 times a day for 28 days	153	95	124	82
<i>Lumban Siantar et al. (2021)</i>	100 grams	1 week	156	94	144	87
<i>Chalida et al. (2019)</i>	200 grams (150 ml)	1 week	167	100	157	91
<i>Siti Fadlilah et al. (2020)</i>	180 ml	Once a day for 1 week	115	79	111	77
<i>Winata et al. (2020)</i>	200 ml	2 times a day for 1 week	149	90	135	85
<i>Silalahi et al. (2020)</i>	100 ml	for 1 week	152	95	137	87
<i>Armaita et al. (2021)</i>	250 ml	Once a day	153	93	136	82
<i>Kongkoli and Askar (2021)</i>	50 grams	Once a day	157	96	137	95
Average			150.25	92.75	135,125	85.75

Based on the results of the analysis of reducing blood pressure after consuming cucumber juice in 8 journals (Table 3) it shows that consumption of cucumber juice in an amount of 100 – 250 ml or 100 – 200 grams for one week can help lower blood pressure in hypertensive patients with an average decrease of 150 /92 mmHg to 135/85 mmHg after being given the cucumber juice therapy.

DISCUSSION

The use of cucumber juice as a non-pharmacological therapy in patients with hypertension was found to have a positive impact on the expected results, where the 8 journals showed significant results on lowering blood pressure in hypertensive patients, according to the analysis' findings in the quasi-experimental study. According to Winata et al. (2020), there was an impact of giving cucumber juice to lowering blood pressure in hypertension when data analysis from 17 respondents was done using the Whitney Maan test technique after receiving treatment (posttest). The control group obtained $p = 0.000 < 0.05$, while the intervention group obtained $p = 0.000 < 0.05$. (Winata et al. 2020). Magnesium, potassium, fiber, and a lot of water are all present in cucumbers. Cucumbers' potassium concentration can help the body's sodium levels remain stable, preventing atherosclerosis, which affects the control of blood pressure. Additionally, cucumbers are high in fiber, which can help decrease cholesterol and control blood pressure (Chalida et al. 2019). Cucumber also includes potassium, which inhibits the Renin-Angiotensin System and lowers aldosterone release, which lowers sodium and water absorption in the kidney tubules (Evania et al. 2022). Due to this process, there is an increase in diuresis, which lowers blood volume and lowers blood pressure. A decrease in peripheral resistance and a reduction in blood pressure are two additional effects of potassium on peripheral blood vessels. For neuromuscular function, 98% of the body's potassium is found inside cells; the

remaining 2% is found outside cells. Potassium influences the activity of both skeletal and cardiac muscles (Mallick 2022). Potassium is the primary intracellular electrolyte. Because cucumbers are 90% water, they have diuretic effects that help the body flush out excess salt. Salt can be bound by the abundant minerals in cucumbers and eliminated through urine. (Kongkoli and Askar 2021)

CONCLUSION

Based on the results of the analysis conducted, it was found that giving therapy using cucumber juice with the right amount and time can help lower blood pressure in people with hypertension.

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EFFECT OF DEEP BREATHING ON REDUCING BLOOD PRESSURE IN ELDERLY WITH HYPERTENSION: LITERATURE REVIEW

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ABSTRACT

Background: The majority of the elderly experience decreased function due to degenerative processes so that non-communicable diseases, one of which is hypertension, often occur in the elderly. Patients with hypertension do not show clear symptoms, so it is necessary to control blood pressure regularly. Hypertension can be a serious threat if left untreated, because it causes various complications. Treatment of hypertension can be done with non-pharmacological therapy, one of which is deep breathing relaxation therapy. Deep breathing relaxation can help reduce excess cortisol hormone secretion so that it can reduce heart rate and blood pressure. **Purpose:** This study was to determine the effect of deep breathing on reducing blood pressure in the elderly with hypertension using a literature review study. **Method:** The methodology of this study uses a literature review. Articles in the form of international journals and national journals published from 2018-2023. The articles were collected using the Google Scholar, Garuda Journal, Pubmed, Elsevier, Crossref, Jane and Springer Link databases using the keywords “deep breathing AND blood pressure AND hypertension AND elderly”. The search results obtained 129 articles according to the keywords. After being screened through PRISMA with inclusion criteria, namely articles according to topic, quantitative research, quasy experiments, elderly respondents and the results of articles measuring blood pressure, 5 articles were obtained that were worthy of review. **Result:** The results of this literature study show that deep breathing can reduce blood pressure in elderly people with hypertension. **Conclusion:** Based on the results of the study, it was concluded that deep breathing has an effect on reducing blood pressure in elderly people with hypertension. It is suggested for future researchers to serve as primary research related to deep breathing non-pharmacological therapy for reducing blood pressure in the elderly with hypertension.

Key words: deep breathing; blood pressure; hypertension; elderly

INTRODUCTION

Elderly is a final stage of a person's life that will be experienced by everyone. Aging is a condition in which a person will experience gradual physical, mental or social decline so that he cannot carry out his daily activities or there is a physical decline (Adam, 2019) . According to WHO, the elderly are divided into three groups: elderly (60-74 years), old (75-90 years) and very old (over 90 years). The biggest problem for the elderly is degenerative disease. The body functions of the elderly are decreasing due to degenerative processes so that non-communicable diseases, including hypertension, are common in the elderly.

Hypertension is an independent and significant risk factor for cardiovascular and cerebrovascular disease. Based on the RI Ministry of Health's national report (2019) the number of people aged ≥ 18 years who suffer from hypertension is 34.11% with a total of 658,201 people. While the prevalence of hypertension that has been diagnosed by a doctor in the population aged 55-64 years reached 5.2%, aged 65-74 years reached 63.2% and aged ≥ 75 years reached 69.5% (Kemenkes RI, 2019) . This means that there are very many elderly people with hypertension in Indonesia.

According to Astutik & Mariyam (2021) , hypertension is sometimes not realized by sufferers. In fact, 50% of people with hypertension have no obvious symptoms, especially when hypertension is in its early stages. Therefore, it is necessary to routinely monitor blood pressure in patients who have risk factors for hypertension.

If left untreated, high blood pressure can pose a serious threat. Uncontrolled blood pressure causes stroke, kidney failure, encephalopathy and seizures (Hariawan & Tatisina, 2020) . Complications that arise must be treated and prevented so that the condition of the elderly with hypertension does not worsen. Proper and effective treatment is needed to prevent complications of high blood pressure. Treatment or control of hypertension can be done in two ways , namely pharmacological therapy and non-pharmacological therapy. Pharmacological treatment uses antihypertensive drugs, while non-pharmacological treatment consists of complementary therapies such as acupuncture, deep breathing relaxation techniques, *guided imagery*, mural therapy and so on (Iqbal & Handayani, 2022) .

One of the non-pharmacological therapies that can be given to hypertensive patients is deep breathing relaxation therapy. Deep breathing relaxation therapy is a technique for taking deep breaths, slow breathing (holding maximum inspiration) and exhaling slowly (Sumartini & Miranti, 2019) . Deep breathing relaxation therapy is used to prevent blood vessel muscle tension so that it can maintain the elasticity of the arteries (Anggraini, 2020) . *Deep breathing* relaxation can help reduce excessive levels of the hormone cortisol, thereby reducing heart rate and blood pressure. Relaxation therapy can lower blood pressure without any side effects.

Based on research by Wijayanti & Setiyo (2017) , that there is an effective deep breathing relaxation technique for lowering blood pressure in hypertensive patients. The study found that when doing deep breathing relaxation techniques in a calm and relaxed state and practiced on respondents for 7 minutes, adrenaline and norepinephrine decreased, resulting in a decrease in blood pressure. Research results Fitriyah et al. (2019) showed that there is effectiveness of deep breathing therapy in reducing blood pressure in hypertensive patients. This is due to breathing therapy in reducing oxygen consumption by the body's cells and increasing CO₂ levels by adjusting the respiratory rate. Increased

CO2 levels stimulate the baroreceptor reflex which then reduces sympathetic activity in the heart, causing a decrease in blood pressure

Based on the background above, the researcher is interested in conducting research with the title "The Effect of *Deep Breathing* on Lowering Blood Pressure in the Elderly with Hypertension".

METHOD

1. Method

The method used by researchers is *Literature Review* by using descriptive narrative analysis of some of the main findings based on research articles that discuss the effect of *deep breathing* on reducing blood pressure in elderly people with hypertension. The author uses *Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA) as a standard in reviewing and owning research articles. The PRISMA guideline is a form of instrument that aims to assist writers in improving the quality of selecting research articles in a systematic manner consisting of 27 checklist items and flowcharts.

2. Eligibility Criteria

The researcher used the PICO(S) standard in determining the eligibility criteria for the articles being reviewed. Articles that are worth reviewing have the criteria as in table 1.

Table 1. Inclusion Criteria

Standard	Criteria
Problem	Hypertension in the elderly
Intervention	<i>Deep breathing</i>
Control	The <i>patient</i> was not given <i>deep breathing therapy</i>
Outcomes	Decreased blood pressure after being given <i>deep breathing</i>
Study design	Quasy experiment

3. Resources

Sources of articles used in this *literature review* used 7 search databases including Garuda Jurnal (38 articles), Google Scholar (61 articles), Crossref (2 articles), Elsevier (3 articles), Jane (1 article), Pubmed (22 articles). and Springer Link (2 articles). The articles used range from 2018-2023.

4. Search Strategy

The article search strategy uses keywords related to the topic and research title using the standard Boolean operator "AND". How to find articles in each database by writing down the keywords as follows "*deep breathing AND blood pressure AND hypertension AND elderly*".

5. Article Selection

The process of selecting articles uses the PRISMA diagram with four stages (Figure 1). The first stage is identification, where the author combines the number of articles from all searches in the database. The second stage is screening, where the writer makes a selection based on the title and abstract of the article. Articles that met the inclusion criteria were included while those that included the exclusion criteria were excluded. The third stage is feasibility, in which the authors make a selection based on full-text articles. Articles that met the inclusion criteria were included while those that included the exclusion criteria were excluded. Furthermore, articles that have been reviewed in full text and meet the inclusion criteria are assessed for the quality of the methodology. In the fourth stage, articles that are relevant to the topic and research title are systematically reviewed.

All search results articles are exported to bibliography software using Mendeley for easy data management and for evaluating abstract titles. After this process is completed and research results are obtained that match the criteria, the next step is to extract the data obtained independently from each study according to the criteria in this literature review.

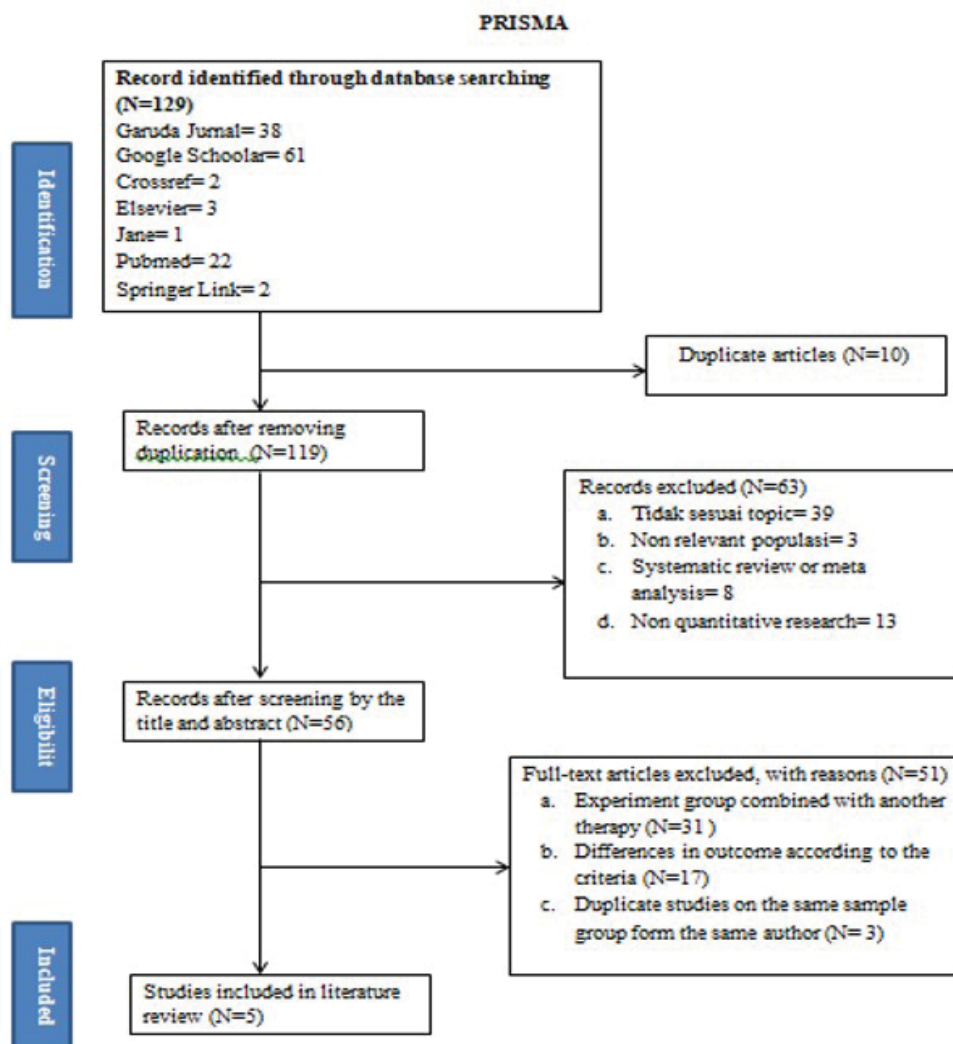


Figure 1. PRISMA

RESULT

1. Article Selection

Based on the results of the search for articles according to the keywords that have been entered, 129 articles were obtained, then screening was carried out and 10 articles were duplicated, leaving 119 articles. Furthermore, the researchers conducted a screening based on the title and abstract, obtained the results of 56 articles that matched the inclusion criteria so that 63 articles were excluded. Then selected in full text, the final result is 5 articles that are worthy of review.

2. Extraction Result Data

Data obtained from articles that passed selection through the PRISMA diagram consisted of titles, author names, year of publication, age of respondents, instruments, research design, interventions, detailed discussion and conclusions (Table 2).

Table 2. Extraction Result Data

<i>Author/Title</i>	<i>Year</i>	<i>Participant</i>	<i>Participant Age</i>	<i>Instruments</i>	<i>Study Design</i>	<i>Intervention</i>	<i>Detailed Topics and Activities</i>	<i>Research result</i>	<i>Conclusion</i>	<i>Data Based</i>
Agus Salim Muhammad Asikin I Tokko Podding M Nasir Abidin Eddie Hassan Abdul Rahman Cultural of Deep Breathing Against Blood Pressure Reduction to Elderly People	2021	13 participants	Elderly	General Identity Questionnaires Observations based on deep breathing or deep breath relaxation techniques carried out in this case observation of deep breathing in the intervention group	Pre- experimental study. One group pretest posttest research design	Deep breathing	Deep breathing relaxation techniques were carried out for 9 days. Researchers taught respondents how to do deep breathing, slow breathing (maximum holding of breath) and how to exhale slowly.	This study obtained the average systolic blood pressure before the intervention was given, namely 148.46 , after the 9th day of the intervention, the average systolic blood pressure was 136.15. Before the intervention was given the average diastolic blood pressure was 89.23 , after the 9th day of the intervention the average diastolic blood pressure was 82.31.	There is an effect of giving deep breaths to reducing blood pressure in the elderly who have hypertension	Google Scholar
Moch Chaerudin Elida Ulfiana Erna Dwi Wahyuni The Effect of Deep Breathing on Blood Pressure Reduction in Elderly Hypertensive Patients at a Retirement Home in Surabaya	2020	Control group 6 responds Intervention group 6 respondents	Elderly	Questionnaires related to demographic data SOP (Standard Operating Procedures) for deep breathing techniques Observation sheets for blood pressure measurement Sphygmomanometer Stethoscope	A quasi experimental research design with two groups of pretest posttest	Deep breathing	The intervention was carried out 3 times a week for 7 days.	The average value of systolic blood pressure before the intervention in the treatment group was 158.33 mmHg and in the control group was 157.69 mmHg. After intervention with deep breathing exercises 21 times for one week, the average value of systolic blood pressure in the treatment group reached 140.00 mmHg.	Deep breathing therapy is effective in reducing blood pressure in hypertensive elderly with consistent intervention seven days in a row	Google Scholar

<i>Author/Title</i>	<i>Year</i>	<i>Participant</i>	<i>Participant Age</i>	<i>Instruments</i>	<i>Study Design</i>	<i>Intervention</i>	<i>Detailed Topics and Activities</i>	<i>Research result</i>	<i>Conclusion</i>	<i>Data Based</i>
Rezkiyah Hoesny Zainal Alim Darmawati The Effect of Depp Breathing Therapy on The Blood Pressure of Hypertension Patients in Health Centre	2019	22 people	Elderly	Observation sheets to observe the administration of a deep breath therapy interventions and write the results of blood pressure measurements before and after the intervention. Mercury sphygmomanometer in mmHg was used to measure blood pressure before or after intervention.	Experimental method with a pre-experimental design: one group pre-test and post-test design	Deep breathing	The position of the respondent is semi Fowler The respondent's hands are placed on the stomach and chest Instruct to breathe slowly and deeply through the nose and inhale for ± 3 seconds (maximum 5 seconds), feel it. Hold your breath for ±3 seconds (maximum 5 seconds). Exhale slowly through your mouth for 5 seconds. Encourage normal rhythmic breathing 3x Do it for 15 minutes, and light rest every 5 breaths	The average value of systolic blood pressure before deep breathing therapy was 155.77 mmHg and the average value after deep breathing therapy was given was 141.50. Furthermore, the average value of diastolic blood pressure before being given breath therapy was 88.23 and after being given breath therapy the average value was 80.50.	There are changes in blood pressure before and after deep breathing therapy	Garuda Journal

<i>Author/Title</i>	<i>Year</i>	<i>Participant</i>	<i>Participant Age</i>	<i>Instruments</i>	<i>Study Design</i>	<i>Intervention</i>	<i>Detailed Topics and Activities</i>	<i>Research result</i>	<i>Conclusion</i>	<i>Data Based</i>
Novian Mahayu Adiutama Hera Hijriani Henry Kurniawan Ward Fauziah Chiou - Feng Lin Deep Breathing Relaxation Techniques to Lowering Systolic Blood Pressure in The Elderly: RCT	2022	108 elderlies	Elderly	Sphygmomanometer	Quasy experiment pre post test	Deep breathing	The intervention was carried out 3 times a day with a duration of 15 minutes for 3 months Inhale slowly and deeply for 4 counts Hold your breath for 3 seconds Exhale slowly for 6-8 counts	The mean value of systolic blood pressure (pretest) in the intervention group was 158.64 mmHg and the control group was 161.36 mmHg. After the intervention was given, the average systolic blood pressure in the treatment group decreased significantly to 152.73 mmHg , while in the control group the results tended to be the same at 160.91 mmHg. Diastolic blood pressure (pretest) in the treatment and control groups showed an average value of 93.64 mmHg and 91.82 mmHg, respectively. After the intervention was given, the average value of diastolic blood pressure in the treatment group decreased significantly to 88.64 mmHg , while in the control group there were no significant results or tended to stay with a value of 92.72 mmHg.	<i>Deep breathing</i> techniques are proven to deliver effects of lowering blood pressure in the elderly	Google Scholar

<i>Author/Title</i>	<i>Year</i>	<i>Participant</i>	<i>Participant Age</i>	<i>Instruments</i>	<i>Study Design</i>	<i>Intervention</i>	<i>Detailed Topics and Activities</i>	<i>Research result</i>	<i>Conclusion</i>	<i>Data Based</i>
Novriani Husna Trimonarita Johan The Effect of Slow Deep Breathing Exercise on Blood Pressure Elderly In PSTW Sabai Nan Aluih, Sicincin Padang Pariaman	2020	21 people	Elderly	Sphygmomanometer	A quantitative research with a quasi experimental research design / design one group pre test post test	Deep breathing	The intervention was carried out in a semi-Fowler's position or sitting The respondent's hand is placed on the stomach Inhale slowly and deeply through your nose. Inhale for 3 seconds and feel your belly expand as you exhale Hold your breath for 3 seconds, curl your lips then exhale slowly for 6 seconds while feeling your stomach/stomach move down The intervention was carried out for 15 minutes for 7 consecutive days	The results showed that before the intervention was given the average systolic blood pressure was 192.38 mmHg and diastolic was 104.29 mmHg. After being given the intervention, the average systolic blood pressure was 15.29 mmHg and 86.19 mmHg diastolic.	<i>deep breathing</i> exercises on blood pressure in the elderly	Google Scholar

DISCUSSION

Hypertension is referred to as a silent disease because many sufferers are not aware of the early symptoms of hypertension (Izzati et al., 2021). This disease is the murasa of various diseases that can cause death. Continuously high blood pressure makes the heart work harder resulting in damage to the heart's blood vessels (Hoesny et al., 2020). The incidence of hypertension is directly proportional to age. Arteries lose their elasticity or flexibility with age (Kathore & More, 2019). In the nursing concept, non-pharmacological therapy can be used to reduce blood pressure in hypertensive patients, including deep breathing relaxation techniques (Asikin et al., 2021).

Deep breathing relaxation technique is a form of stress management aimed at making lifestyle changes. Deep breathing techniques can make the body more calm and harmonious, and can empower the body to overcome disturbances that attack the body. The advantages of this deep breathing relaxation technique are that it can be done anytime, anywhere, the method is very simple and the patient can do it independently without media and can relax tense muscles (Chaerudin et al., 2020).

Based on article 1, the results of research conducted by Asikin et al. (2021) at the Tresna Werdha Gau Mabaji Social Institution, Gowa Regency, with a total of 13 respondents. The intervention group was given deep breathing relaxation techniques which were carried out for 9 days. Researchers taught respondents how to do deep breathing, slow breathing (maximum holding of breath) and how to exhale slowly. This study obtained the average systolic blood pressure before the intervention was given, namely 148.46, after the 9th day of the intervention, the average systolic blood pressure was 136.15. After the statistical test was carried out, it was obtained that the p value = 0.000, which means that there is an effect of *deep breathing* on reducing blood pressure. Before the intervention was given the average diastolic blood pressure was 89.23, after the 9th day of the intervention the average diastolic blood pressure was 82.31. After testing the statistics, it was found that the p value = 0.108, which means that there is no effect of giving *deep breathing* on reducing blood pressure.

After being given deep breathing relaxation techniques until the 9th day, it can be seen the effectiveness of deep breathing in reducing blood pressure in the elderly. Deep breathing relaxation techniques are effective for lowering blood pressure in the elderly, without side effects and easy to do everyday. This relaxation technique helps the body stay relaxed, can supply oxygen levels that the body needs urgently, helps ease the work of the heart and keeps blood vessels in order.

Based on article 2, the results of a study conducted by Chaerudin et al. (2020) at the Hargodedali Nursing Home with a total sample of 12 respondents divided into 6 respondents in the intervention group and 6 respondents in the control group. The intervention group will be given deep breathing techniques for 7 days, and their blood pressure will be measured before and after the intervention. Characteristics of respondents based on age showed that most of the respondents in each group were aged 70-85 years, namely 4 people in the intervention group (66.7%) and 4 people in the control group (66.7%). Characteristics of respondents based on gender shows that all respondents in each group are women. The average systolic blood pressure before and after the intervention was different for each group. It was observed that the mean value of systolic blood pressure before the intervention in the treatment group was 158.33 mmHg and in the control group was 157.69 mmHg. After intervention with deep breathing exercises 21 times for one week,

the average value of systolic blood pressure in the treatment group reached 140.00 mmHg . The results of statistical analysis using the independent t-test between the control group and the treatment group obtained $p=0.002$ which concluded that there was a difference in systolic blood pressure between the two groups.

The treatment group performed deep breathing techniques three times a week for 7 days. In every 15 minutes of exercise there is a decrease in systolic blood pressure of 140.00 mmHg . After 7 days of intervention, the lowest mean systolic blood pressure was in the deep breathing treatment group, namely 140 mmHg. While the control group reached 160 mmHg. Deep breathing exercises and techniques are effective in reducing blood pressure in elderly people with hypertension.

Based on article 3, the results of research conducted by Hoesny et al. (2020) in the Work Area of the Wara Community Health Center, Palopo City, with a total sample of 22 people. The procedure for data collection was for the respondent to sign an informed consent when the respondent intervened in a semi-Fowler's position. Blood pressure was measured before the intervention. The respondent's hands are placed on the stomach and chest, advised to breathe slowly and deeply through the nose and inhale for ± 3 seconds (maximum 5 seconds), feel it. Hold your breath for ± 3 seconds (maximum 5 seconds). Exhale slowly through your mouth for 5 seconds. Encourage normal rhythmic breathing 3 times. Performed for 15 minutes, and light rest every 5 breaths. Then measure the patient's final blood pressure (post test). This was done for 3 consecutive days on one respondent.

Prior to the intervention, the majority of respondents had systolic blood pressure of 130-159 mmHg by 15 respondents (86.4%) and respondents who had systolic blood pressure of 160-189 mmHg by 7 respondents (31.6%). After being given breath therapy, systolic blood pressure of 130-159 mmHg increased to 21 respondents (95.5 %) and blood pressure of 160-180 mmHg decreased to 1 respondent (4.5%). Prior to the intervention, the majority of respondents who had diastolic blood pressure <85-89 mmHg were 13 respondents (59.1 %), and respondents who had diastolic blood pressure 90-99 mmHg were 9 respondents (40.9%). After giving breath therapy to respondents, diastolic blood pressure in the category <85-89 mmHg increased to 21 respondents (95.5 %) and after being given interventions, respondents' diastolic blood pressure in the category 90-99 mmHg decreased, namely 1 respondent (4.5%)). The average value of systolic blood pressure before deep breathing therapy was given was 155.77 mmHg and the average value after deep breathing therapy was given was 141.50. Furthermore, the average value of diastolic blood pressure before being given breath therapy was 88.23 and after being given breath therapy the average value was 80.50. The data was tested using the Kolmogorov-Smirnov normality test and obtained a p-value of 0.710 more than 0.05, so it can be concluded that the data is normally distributed. From the results of the statistical analysis of the paired sample T-test, it was obtained that the value of $p = 0.000 < \dot{y} 0.05$ means that there is an effect of deep breathing therapy on blood pressure in hypertensive patients in the work area of the health center in Palapa.

Based on article 4 the results of research conducted by Adiutama et al. (2022) with a total sample of 108 elderly. The procedure given is to inhale slowly and deeply for 4 counts, then hold for 3 seconds and exhale slowly for 6-8 counts or according to the patient's tolerance. This deep breathing exercise is done 5 to 10 times for 15 minutes 3 times a day. The results showed that the average systolic blood pressure (pretest) in the intervention group was 158.64 mmHg and the control group was 161.36 mmHg. After being given a deep breathing relaxation intervention for 7 days, it was found that the average systolic blood

pressure value in the treatment group decreased significantly to 152.73 mmHg, while in the control group the results tended to be the same at 160.91 mmHg.

Diastolic blood pressure (pretest) in the treatment and control groups showed an average value of 93.64 mmHg and 91.82 mmHg, respectively. After being given a deep breathing relaxation intervention for 7 days, it was found that the average value of diastolic blood pressure in the treatment group decreased significantly to 88.64 mmHg, while in the control group there were no significant results or tended to stay with a value of 92.72 mmHg.

The results of the paired t test showed that there was no significant difference between the mean systolic blood pressure before and after the intervention in the control group ($p = 0.724$). The results of the paired t test showed that there was a significant difference between the mean systolic blood pressure before and after the intervention in the treatment group ($p = 0.005$). The independent t test between the treatment and control groups showed that there was a significant difference in the systolic blood pressure delta value with $p=0.015$. This value indicates that relaxation techniques are proven to reduce systolic blood pressure.

Based on article 5, the results of research conducted by Novriani & Johan (2020) with a total sample of 21 respondents. The results showed that before the intervention was given the average systolic blood pressure was 192.38 mmHg and diastolic was 104.29 mmHg. After being given the intervention, the average systolic blood pressure was 152.73 mmHg and 86.19 mmHg diastolic. The paired sample t test showed that the p-value for blood pressure pretest systole and posttest systole was 0.000 ($p < \alpha$). It can be concluded that there is an effect of slow deep breathing exercise on systolic blood pressure. Furthermore, the result of p diastolic blood pressure is 0.002, which means that there is an effect of deep breathing exercises on diastolic blood pressure. So it can be concluded that slow deep breathing exercises have an effect on reducing blood pressure in elderly people with hypertension.

Deep breathing has the effect of increasing the fluctuations in the RR interval (breathing rate). Increased RR interval fluctuations (relative to changes in blood pressure) have the effect of increasing the effectiveness of *the bare reflex* and may contribute to lowering blood pressure. Deep breathing also reduces sympathetic activity by increasing the central inhibitory rhythm which in turn results in a decrease in blood pressure when *the bare reflex* is activated. Deep breathing also affects the increase in tidal volume thereby activating the Vulling-Breuer reflex which results in a decrease in flexion activity and ultimately increases sensitivity *bare reflex*. This mechanism can reduce sympathetic activity and blood pressure (Kumari, 2018). Will automatically stimulate the sympathetic nervous system to reduce levels of ketocholamines. Ketokolamin is a substance that can narrow blood vessels so that it can cause an increase in blood pressure. When the activity of the sympathetic nervous system decreases due to the relaxing effect, the production of catecholamine substances decreases, causing blood vessels to widen and eventually blood pressure will decrease (Martyastuti & Yuliyanto, 2019).

Based on the results of this *literature study*, it was found that deep breathing relaxation techniques can reduce blood pressure in the elderly with hypertension. The decrease obtained with relatively significant results from some of the literature used.

CONCLUSION AND RECOMMENDATION

Conclusion

The conclusion that can be drawn from the 5 articles reviewed, with a hypertensive elderly population, interventions in the form of deep breathing relaxation techniques obtained a total sample of 176 respondents. Based on this literature study, it was concluded that *deep breathing* has an effect on reducing blood pressure in elderly people with hypertension.

Recommendation

Deep breathing non-pharmacological therapy for reducing blood pressure in the elderly with hypertension.

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THE INFLUENCE OF ELDERLY EXERCISE ON THE LEVEL OF BACK PAIN: LITERATURE REVIEW

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ABSTRACT

Background: Elderly is a natural period that occurs starting in childhood, adulthood and old age which cannot be avoided by every individual. In old age, many elderly experiences decline, such as physical decline, namely with skin becoming wrinkled due to lack of fat, graying hair, reduced hearing, blurred vision, tooth loss, activity becomes weak, appetite decreases and body condition also experiences decline which results in some elderly experiencing dependence. physical and economic, chronic pain. There are many health problems in the elderly, one of which is the musculoskeletal system, namely joints where weight bearing joints occur and bone formation on the joint surface is common. The components of the capsule break down and the collagen in the connective tissue increases progressively which, if not used, causes inflammation, pain, decreased joint mobility, and deformity. Back pain is a feeling of pain in the lumbosacral and sacroiliacal areas, the mobility of the lower back is very high, besides that it also supports the body's weight and at the same time is very close to other tissues. The impact of pain is caused by sensitivity and loss of function in the lower back, pain stimulation in the form of mechanical stimulation, thermic or chemical temperature and a mixture of receptors, namely free nerve endings which have specific action potentials here where action potentials and impulses are transmitted to the pain center. **Purpose:** This research was conducted to determine the effectiveness of elderly exercise for reducing back pain. **Method:** The research methodology used is Literature Review in the form of International Journals and National Journals published in 2019-2023. Literature collection used the Google Scholar, Pudmed and NCBI Journal databases with the keywords: Elderly, Elderly Exercise, Back Pain, Joint Pain. **Result:** The search results obtained 203 articles according to the keyword. After screening through a prism with the following criteria: articles related to elderly exercise for back and joint pain, articles related to the benefits of elderly exercise for back and joint pain, all previous methods were included. Thus, 4 articles were obtained consisting of 3 National Journals and 1 International Journal which were reviewed. The results of the review show that regular elderly exercise can reduce the level of back pain and joint pain in the elderly. **Conclusion:** From the results of this study, it can be concluded that elderly exercise affects the level of back and joint pain in the elderly.

Key words: Elderly, Elderly Exercise, Back Pain

INTRODUCTION

Elderly is a self-occurring (natural) process starting from childhood, adulthood and old age that cannot be prevented by any individual. The process of aging is a process that occurs throughout life, not only starting from a certain time, but starting from the beginning of life. Old age experiences physical deterioration due to reduced fat pads, graying of hair, reduced hearing, deteriorating eyesight, tooth decay, slow activity, decreased appetite and body condition that experiences weakness and setbacks which can cause some of the elderly to experience physical and economic dependence and chronic pain (Juli Andri, Resi Karmila, Padila, 2019). Many elderly people in Indonesia experience disorders that occur in the health of the elderly, one of these problems is a disorder that occurs in the musculoskeletal system, namely joint problems (Juli Andri, Resi Karmila, Padila, 2019).

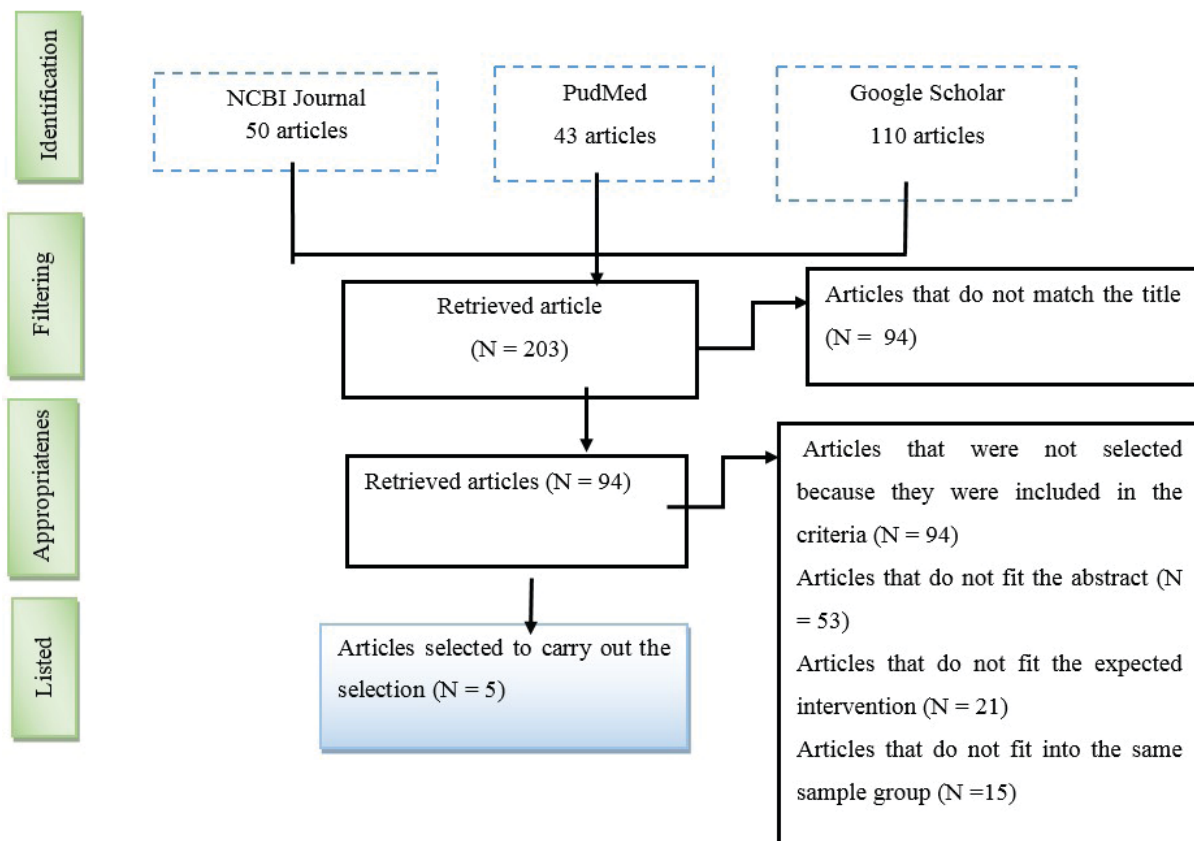
Joint deterioration, mostly occurring in weight-bearing joints and forming bone at the joint surface, is common. Components of the joint capsule break down and the collagen present in the connective tissue increases progressively which, if not used, may cause inflammation, pain, decreased joint mobility, and deformity. Low back pain (NBP) is pain that is felt in the lower back area, which can be local pain (inflammation), radical pain or both. The pain is felt between the corners of the lower ribs and the folds of the lower buttocks, namely the lumbar or lombo-sacral area and is often accompanied by pain radiating towards the legs and feet. Pain originating from the lower back can be referred to other areas or vice versa pain originating in other areas is felt in the lower back area (referred pain) (Tjokorda, 2019).

Lower back pain is a feeling in the lumbosacral and sacroiliac areas. The mobility of the lower back is very high, the amping, it also supports the weight of the body and at the same time it is very attached to other tissues (Mathematics, 2022). The impact of pain is caused by sensitivity and loss of function in the spine in the lower back. Pain can be in the form of mechanical stimulation, stimulation or chemical temperature and the mixture is received by receptors containing free nerves which have specific characteristics in which potential action occurs and these impulses are transmitted to the pain center (Mathematics, 2022). Handling pain in the elderly can be overcome by finding activities that match the physical and spiritual abilities of the elderly such as stretching, gymnastics, nutritious food, suggest adequate rest, physiological assessment, cognitive assessment (Hiidayat & Hannan, 2021).

METHOD

This research uses the literary study method. Variable in this writing is the implementation of the elderly gymnastics training to reduce back pain. The artifacts used in this writing are national and international artifacts which discuss the educational attainment and reliability of elderly gymnastics training to reduce back pain with research conducted at the NCBI Journal, Google Scholar, and PubMed. The criteria for inclusion in this study are national and international journals that are related to gymnastics for the elderly to reduce back pain published within five years (2019-2023), full textual content and with quantitative, qualitative research methods. The researcher uses the PRISMA Flow Diagram Protocol in analyzing various articles according to the inclusion criteria. In the search, the results of the NCBI Journal were 50 articles, Google Scholar 110 articles and PubMed 43 articles. Then proceed with the selection according to the inclusion criteria. The results of the test using JBI's critical appraisal resulted 6 small articles which were then

used research samples.



RESULTS

Table 1. The Influence of Elderly Gymnastics on Reducing the Level of Back Pain

No	Researcher	Method	Results
1.	(Kurdi et al., 2022)	demonstration method. To find out the level of success, the Wilcoxon statistical test was carried out using SPSS 21.	The elderly's health care for a slight reduction can be done in a minimum of 30 minutes Per daily for 5 times in 1 week, if the elderly have hiipeirteinsii problems and cholesterol is recommended Doing gymnastics for the elderly for 40 minutes with intensity 3-4 times a week

No	Researcher	Method	Results
2.	(Malo et al., 2019)	<p>This method analyzes the data using this method, namely the statistical Marginal Homogeneity Test ($p \leq 0.05$). The results of the research show that pain as a whole has previously been carried out in ergonomists to a large extent belonging to the uncontrolled pain scale category of 29 people (64.4%). Pain as a result of carrying out ergonomic exercises is largely categorized as non-painful, as many as 32 people (71.1%).</p>	<p>The results of the research have an ergonomics dynamic influence on the pain scale scale for the elderly women in the Ciipiiring Ili Landungsarii Malang Posyandu Area for the elderly</p>

No	Researcher	Method	Results
3.	(Tumanggor & Ginting, 2020)	<p>The method used is the pre-experimental group design and post-equipment group design, i.e. there is no comparison (control) group. But the first observation (pretest) has been made which allows for refinements that can improve the changes resulting from such a refinement. The sample is the part of the population that will be excluded or part of the characteristics shared by the population. The method for collecting samples is to take all the participants and participate in a sample (total sampling) of 20 people. What determines the variation in this exercise is the level of lower back compensation in the elderly. This research uses a paired statistical t test with $\alpha < 0.05$. In instrument</p> <p>This research is in the form of interviews and observations carried out before and after the research.</p>	<p>Basic rate of return to their older adults and are characterized by diverse levels of education at a significant level</p>

No	Researcher	Method	Results
4.	(Mathematics, 2022)	<p>The method used is Prei-eikspeiriimeint Deisaign in the form of a Onei Group preiteist-posteist design. The collection of research data was carried out on May 12 2022 at the Nanggalo Padang Public Health Center with a sample size of 20 people taken from a purposive sampling technique. The research instrument uses Visual Analogue Scales (Vase). The data were analyzed using the T-Theist statistical paireid sample test.</p>	<p>The results of the results showed that there was a decrease in the level of pain after carrying out physical exercise: stretching the level of lower back pain in the elderly at the Nanggola Community Health Center, Padang.</p>
5.	(Lee et al., 2020)	<p>Qualitative analysis of randomized controlled feasibility tests. Subject: Eight thousand years of age (65+ years) with cLBP of at least moderate intensity</p>	<p>Functional benefits, pain relief pain reduction/peireida, psychological benefits, the importance of social support in learning t'aii chii, and iinteigrasii t'aii chii kei in daily activities. The most common functional benefits are improved balance, flexibility, leg strength, and body posture. Some reported a reduction in pain or elimination of pain, but others did not. Improved Relaxation, relaxation, and a sense of connectedness are sub-themes that arise from psychological spiritual benefits. eifeik. The benefits of social support include motivation to pursue skills and group support while learning new skills. Ultimately, better body awareness allows participants to seek to integrate t'aii chii kei skills into their daily activities.</p>

DISCUSSION

The results of the analysis obtained by the researcher from the stages of ideation, screening and feasibility testing of the critical appraisal resulted in 5 articles which were appropriate to the discussion, namely the application of gymnastic exercises for the elderly to reduce back pain.

In this study (Kurdii et al., 2022) the results were obtained that the service was carried out in stages over 1 week at PSTW Jeimbeir, especially at Wiisma Teiratai where there were 11 elderly people with ages >50 years, the activity started with health screening for 2 days, the result was that the majority of the elderly are at Teiratai guesthouse has a liinu-liinu ecstasy in his bones. Then carried out the implementation of health research on the benefits of the elderly gymnastics and continued with group activities, namely the Beirsama elderly gymnastics with 11 Wismas senior citizens. The qualitative data obtained was carried out using the directed discussion method by asking several questions to the elderly regarding the effectiveness of the six elderly groups that had been carried out, for quantitative data obtained from data collection using the instrument numerical chain scale to evaluate the pain scale. Data on the level of pain in the elderly before and after the six elderly gymnastics were presented in prei post form using the Wiilcoxon bivariate test. The result was obtained after it was carried out in the form of an elderly gymnastics towards a decrease in the level of pain in the elderly who were treated for 2 days against 11 elderly people. seniors seinam and grinning seinii. The success of the elderly gymnastic towards decreasing the pain scale alone can be done at least 30 minutes per day for 5 times in 1 week.

In research (Malo et al., 2019) by using prei-eikspeirimeintal design with onei group prei testist and post theist design. The population in this study were all the elderly in the Posyandu Elderly Ciipiiriing II Landungsarii Malang area of 51 people. The number of samples used was 45 respondents, with the sample collection technique in this study was simple random sampling. Vaiirabeil deipeindein i.e. the scale of painstakingly and vaiirabeil iindeipeindeint seinam, in eirgonomiis. The results of the marginal homogeneity analysis showed that there was an eirgonomic dynamics effect on individual pain scales in the elderly Wanita in the Ciipiiriing Iili Posyandu area of Malang with significant values. In the research (Tumanggor & Giintiing, 2020) with the method using the pre-experimental research design with the onei group preiteist-postteist design, that is, there is no control group, but the first observation (preiteist) has been carried out which allows the researcher to be able to test changes that occur it happened seitelah presence of eikspeiriimein. Performed on 20 respondents to the effect of hip movement training (stretching) on the level of lower back pain in the elderly was carried out from April to early May with a time span of approximately 2 weeks in the village of Sarii Sub-District of Delii District of Delii Seirdang. The results obtained for 20 respondents indicated that there was a difference between low back pain in Reispondein Beileium and after being given Inteirveinsii, illustrating that the elderly who were given Inteirveinsii or implementation of hip stretching exercises reduced the value of pain scale on the low back it can be seen that the hypotheses of the research have been tested, as evidenced by used the Paireid t-Teist test with level of significant = 0.05 (5%) which obtained a $p = 0.017$ for the effect of stretching exercise on the level of lower back pain in the elderly.

Research from this study (Mathematics, 2022) research with a specific research was carried out at the Public Health Center in Nanggalo Padang from December to July 2022. The population of this research is the elderly who experience pain i lower back and the elderly who are actively participating in the elderly gymnastics in the Nanggalo

health center as many as 25 people. The research took a sample of 10 elderly people, all of whom had met the specified sample criteria, the sampling was carried out with purposive sampling. It was found that the maximum and minimum pain thresholds in the elderly were 9 and 2, the maximum and minimal immune scales in the elderly were 7 and 0. The results of the statistical test found a p value of 0.000 (≤ 0.05) This result indicated that there was an influence on Flexibility training. iing on the decrease in the level of lower back pain in the elderly. Then the average pain scale before being given the Fleiksii Wiilian: stretching exercise in the elderly at the Nanggalo Padang Puskeimas, the mean of the Nyirii scale after being given the Fleiksii Wiilian: stretching exercise for the elderly at the Nanggalo Padang Puskeimas was 2.80. The results obtained were p-value = 0.000, which means that there is an effective functional exercise of flexibility: stretching in reducing the level of lower back pain in the elderly at the Nanggalo Padang Public Health Center.

Then the research results (Leiei et al., 2020) with the research method qualitative analysis of randomized controlled feasibility tests. Subjects: Eighteen participants (65+ years) with a cLBP of at least moderate intelligence. The results obtained were functional benefits, pain reduction/pain relief, psychological benefits, importance of social support in learning t'aii chii, and integration of t'aii chii in daily activities. The most common functional benefits are improvements in balance, flexibility, leg strength, and posture. Some report pain relief or pain relief, but others do not. Enhanced relaxation, mindfulness, and a sense of connectedness are sub-themes that arise from effective psychospiritual benefits. The benefits of social support include motivation to attend classes and group support while learning new skills. Ultimately, better body awareness allows participants to integrate t'aii chii kei skills into their daily activities.

CONCLUSION

Exercise for the elderly to reduce back pain in the elderly is effective by implementing exercise in the elderly regularly and every day for 30 minutes can reduce back pain in the elderly. The application of gymnastics for the elderly can be done using methods or movements that are easy for the elderly to understand and easy to do. With a balance of technology and information, elderly gymnastics can be carried out with various modifications of movements so that it makes it easier for the elderly to do elderly gymnastics and does not cause boredom when doing elderly gymnastics.

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DESCRIPTION OF NURSE'S CARING BEHAVIOR IN INPATIENT ROOMS INDRAMAYU REGENCY HOSPITAL

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ABSTRACT

Background: Caring is an important core part, especially in nursing practice. A patient who is being treated in a hospital really expects attention and help from a professional nurse who is fast and precise. **Purpose:** The purpose of this study was to describe the caring behavior of nurses in the inpatient room of the Indramayu District General Hospital. **Method:** The research method used is descriptive. The population is nurses as many as 64 nurse respondents in 5 inpatient rooms at Indramayu District Hospital. The sample uses the total population technique. The research instrument uses a questionnaire. Data analysis in this study was in the form of univariate analysis. **Result:** The results of the study showed that 37 (57.8%) respondents had applied good caring behavior to patients and 27 (42.2%) respondents had not applied caring behavior to patients. **Conclusion:** Most of the respondents have implemented good caring behavior. Suggestions for health service institutions in Indramayu District Hospital to improve caring behavior with various activities that can improve nurse caring behavior by participating in training, providing rewards or in-house training activities on caring for nurses on a regular basis.

Key words: Caring behavior; Employment Status; Inpatient Room

INTRODUCTION

Caring is a universal phenomenon that affects the way we think, feel and behave when interacting with others. Respect other people and have a feeling of belonging and responsibility (Potter & Perry, 2009). Caring is an important interpersonal process that requires nurses to carry out specific role activities through certain emotional expressions for Morrison & Burnard clients (in Kusnanto, 2019).

The National League For Nursing (2007) and The American Association of Nursing (2008) also state that caring is fundamental in nursing. The competence of a nurse

and caring behavior are both important in providing care, so that patients feel safe and comfortable while undergoing treatment, and caring is important for the quality of nursing (Rhodes, 2011).

The concept of caring has been developed since 1975. Caring in nursing is a patient's demand for a nurse's behavioral attitude. In Milton Mayeroff's analysis of the meaning of caring in human relations (Watson, 2018) describes caring as a process that gives to someone (both care givers and care recipients for personal growth).

The act of caring has the goal of being able to provide physical care by paying attention to emotions while increasing the client's sense of comfort and security. Caring also emphasizes individual self-esteem, meaning that in carrying out nursing practice, nurses must always respect clients by accepting the client's strengths and weaknesses so that they can provide appropriate health services (Kusnanto, 2019).

The results of research conducted by Valentina (2019) explained that the caring behavior of nurses implementing hospital inpatient rooms in the patient's perception was mostly unfavorable as much as 55.2% and 44.8% good. According to the patient, the aspect that has been done the most is related to concern for what other people will experience, while the aspect that needs the most attention is knowledge and professional skills. Based on these results, hospital management is expected to be able to evaluate and establish policies to include nurse caring behavior and standard operating procedures for implementing nursing care.

Based on this phenomenon, it can be seen that there are still nurses who have not displayed caring behavior. This will be a problem for patient comfort, so that it can affect patient satisfaction, therefore the author is interested in taking the topic of the description of caring behavior of nurses in the inpatient room of the Indramayu Regency Hospital.

METHOD

This study used a correlation study with a descriptive approach to find out how the caring behavior of nurses in the inpatient room of the Indramayu District Hospital. The research variables were divided into two, namely the nurse caring variable, while the sub-variables were gender, length of work, education level, employment status, age. The population to be studied were nurses who were in the inpatient room of the Indramayu Regency Hospital as many as 64 people who would be selected as respondents according to the inclusion criteria as follows: Willing to be a respondent, Status as an implementing nurse in an inpatient room. Exclusion criteria are as follows: Nurses who are on leave for more than 1 week / 1 month, Nurses who are still in place orientation status. Research ethics consists of 3 principles, namely: the principle of benefit, the principle of respecting human rights and the principle of justice (Nursalam, 2017).

RESULT

This research was carried out in August 2022 in 5 inpatient rooms at the Indramayu District Hospital with a total sample of 64 respondents. The results of this study include univariate analysis. The characteristics of the respondents studied included length of service, level of education, gender, age, and employment status. From the results of this

research, it is known that the average length of work is 9.8 years with a standard deviation of 5,839, with a new length of work of 1 year and 25 years of old employment. The average age of the respondents was 35.45 years with a standard deviation of 6.292, the youngest was 25 years old and the oldest was 55 years old.

Table 1. Distribution of Respondent Characteristics (n=64)

No	Characteristic	Frequency (f)	Percentage (%)
Gender			
1	a. Male	25	39.1
	b. Female	39	60.9
	Total	64	100
Education			
2	a. DIII	29	45.3
	c. S1+Ners	35	54.7
	Total	64	100
Employment Status			
3	a. PNS	15	23.4
	b. PT	34	53.1
	c. PTT	15	23.4
	Total	64	100
Age			
4	Young	36	56.2
	Old	28	43.8
	Total	64	100
Length of work			
5	New	31	48.5
	Long	33	51.5
	Total	64	100

Based on table 1. it is known that the characteristics of the respondents are gender, education level, employment status, age and length of work, it is known that 39 (60.9%) of the respondents are female, 35 (54.7%) of respondents have S1 + Nurses education, 35 (53.1%)) of the respondents worked as permanent employees at the hospital, as many as 36 (56.2%) of the respondents were young, and as many as 33 (51.5%) of the respondents had long working hours.

a. Description of Nurse Caring Behavior. An overview of nurse caring behavior can be seen in table 2.

Table 2. Frequency Distribution of Nurse Caring Behavior Descriptions (n=64)

No	Caring Behavior	Frequency (f)	Percentage (%)
1	Good Caring	37	57.8
2	Less Caring	27	42.2
Total		64	100

Based on table 2, it is known that, of the 64 (100%) respondents with good caring behavior \geq 82 median, 37 (57.8%) respondents with good caring behavior.

b. Nurse Caring Behavior Based on Years of Service Caring behavior based on length of work can be seen in table 3.

Table 3. Frequency Distribution of Nurse Caring Behavior Descriptions Based on Age (n=64)

Length of Work	Criteria				Total (f)	Percentage (%)
	Good Caring	(%)	Less Caring	(%)		
New	14	45.2	17	54.8	31	100
Long	23	69.7	10	30.3	33	100
Total	37	57.8	27	42.2	64	100

Based on table 3, it is known that, out of 31 respondents with new employment <9 years, 17 (54.8%) respondents did not apply caring behavior. Of the 33 respondents with a length of \geq 9 years 23 (69.7%) respondents have good caring behavior.

c. *Nurse Caring Behavior Based on Education Level As for knowing the caring behavior of nurses based on education level, it can be seen in table 4.*

Table 4. Frequency Distribution of Nurse Caring Behavior Descriptions Based on Education Level (n=64)

Education Level	Criteria				Total (f)	Percentage (%)
	Good Caring	(%)	Less Caring	(%)		
DIII	16	55.2	13	44.8	29	100%
S1+Ners	21	60.0	14	40.0	35	100%
Total	37	57.8	27	42.2	64	100%

Based on table 4 it is known that, out of 29 respondents with education level DIII, 16 (55.2%) respondents had good caring behavior. Of the 35 respondents with an undergraduate + nurse education level, 21 (60.0%) had good caring behavior.

d. *Nurse Caring Behavior Based on Gender Caring behavior based on gender can be seen in table 5.*

Table 5. Frequency Distribution of Nurse Caring Behavior Descriptions by Gender (n=64)

Gender	Criteria				Total (f)	Percentage (%)
	Good Caring	(%)	Less Caring	(%)		
Male	16	64.0	9	36.0	25	100%
Female	21	53.8	18	46.2	39	100%
Total	37	57.8	27	42.20	64	100%

Based on table 5 it is known that, out of 25 male nurse respondents, 16 (64.0%) respondents had good caring behavior. Of the 39 female nurse respondents who had good caring behavior as many as 21 (53.8%) respondents. e. Nurse Caring Behavior Based on Age Nurse caring behavior by age can be seen in table 6.

Table 6. Frequency Distribution of Nurse Caring Behavior Descriptions Based on Age (n=64)

Age	Criteria				Total (f)	Percentage (%)
	Good Caring	(%)	Less Caring	(%)		
Young (< 35 years old)	20	55.6	16	44.4	36	100
Old (≥ 35 years old)	17	60.7	12	39.3	28	100
Total	37	57.8	27	42.2	64	100

Based on table 6 it is known that, out of 36 respondents with a young age <35 years, 20 (55.6%) had good caring behavior. Of the 28 respondents aged ≥ 35 years who had good caring behavior, 17 (60.7%) respondents.

e. Nurse Caring Behavior Based on Employment Status Nurse caring behavior based on employment status can be seen in table 7.

Table 7. Nurse Caring Behavior Based on Employment Status (n=64)

Employment Status	Criteria				Total (f)	Percentage (%)
	Good Caring	(%)	Less Caring	(%)		
PNS	10	66.7	5	33.3	15	100
PT	21	61.8	13	38.2	34	100
PTT	6	40.0	9	60.0	15	100
Total	37	57.8	27	42.2	64	100

Based on table 7 it is known that, out of 15 nurse respondents with civil servant (PNS) employment status, 10 (66.7%) had good caring behavior. Of the 34 nurse respondents with employment status as Permanent Employees (PT), 21 (61.8%) had good caring behavior. Of the 15 respondents with employment status of Non-Permanent Employees (PTT), 9 (60.0%) respondents did not apply caring behavior enough.

DISCUSSION

Based on the results of the research on the description of caring behavior of nurses in the Inpatient Room of the Indramayu Regency Hospital, it is known that nurses have good caring behavior if the score is ≥ 82 , the median is 37 (57.8%) respondents have good caring behavior and 27 (42.2%) nurses do not apply caring behavior because the score is < 82 median.

This research is in line with the research of Pardede & Simamora (2020) that the caring behavior of the majority of nurses was good, 51.9%. Caring behavior is very important to be applied by a nurse in implementing it because by implementing caring behavior, the nurse means that she is able to show empathy and provide support and has been able to provide good service to patients. Caring behavior is a form of nurse performance that can be influenced by age, gender, education, employment status and years of service.

From the results of Zees' research (2011) it was stated that nurses with a long service life of ≥ 5 years and nurses with a new employment period of < 5 years can both show caring behavior towards patients and there is no significant difference based on length of service. Work experience does not necessarily guarantee good performance, depending on the motivation of the employees themselves (Riani, 2011).

Working period can affect a person's attitude and behavior in showing his performance. A longer working period indicates more experience for someone compared to other co-workers (Tahir, 2014).

The results of this study are in line with research by Dewi (2010) that the higher the education level of a nurse, the higher the critical thinking, mature logic, systematic thinking and the increasing quality of caring for nurses. A nurse will work more professionally than a nurse with a diploma, because the critical thinking of a nurse is much more mature than a nurse with a diploma. Therefore education has an impact on nurses, especially in providing nursing care in shaping caring behavior. This study shows that education has an effect on nurse caring behavior because of one's knowledge. Someone with more education tends to be better at behaving and behaving. Nurses with higher levels of education are able to provide insight, knowledge, teach, explain and are able to act better than nurses with lower levels of education. So that education is directly proportional to behavior, especially caring for patients.

The quality of nursing management is an approach that focuses on nursing care (management of care), with the main objective of care management being the development of nursing human resources. Caring is a capital that must be owned by nurses in improving the quality of nursing care. The development of caring nurses in an evident based practice (EVB) has been proven to improve the performance of nursing human resources (Keliat, 2012).

The results of the study explain that female nurses are more caring because they have instincts as mother instincts compared to male nurses, women tend to analyze a problem more deeply and carefully before making decisions than men so that they will behave ethically better than male nurses. Maybe because there are gender differences, it is no longer applicable to society. Nurses in charge work according to the job descriptions that have been set and apply to all nurses regardless of gender. The results showed that the caring behavior of the majority of practicing nurses was in the good category, namely

70.31% according to the researchers, this was due to the age of the respondents who were aged 25-55 years, the older the age, the more caring, because these nurses will be more patient, experienced and will be more mature to applying caring behavior to patients (Wahyudi, 2016)

Caring behavior researchers assume because knowledge and skills will decrease with increasing age, increasing age will cause a decrease in speed, dexterity and strength and increase in boredom due to lack of intellectual stimulation (Letvak, 2016).

This happens to remind the status of employees who are in a better position to provide a sense of comfort in carrying out their work. Reward and reward factors in the background sub variable also influence caring behavior. This is in accordance with the theory of Gibson (2006).

In line with the results of the study which explained that the implementing nurses in the inpatient ward had different staffing status did not differentiate caring behavior towards their patients, it can be seen from the value of the achievement of caring behavior of implementing nurses 57.80% of the total value, so there are other factors that make nurses behave caring other than employment status.

CONCLUSION AND RECOMMENDATION

Conclusion

As many as 57.8% of respondents have good caring behavior

Recommendation

Suggestions for health service institutions to improve caring behavior with various activities that can improve nurse caring behavior by participating in training, giving rewards or in-house training activities on caring for nurses on a regular basis.

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ANALYSIS OF TECHNICAL READINESS TO USE TELEHEALTH SERVICES AT BANTUL PRIMARY HEALTH CENTERS

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ABSTRACT

Background :The COVID-19 pandemic has prompted Primary Health Center to take steps to prevent the spread of the disease by implementing social restrictions. Telehealth is one of the ways in which the Primary Health Center can address health service issues. In implementing Telehealth, there are several things that need to be well prepared, such as hardware, software, good network quality, and online service support. **Purposes :**To provide an overview of the factors involved in implementing Telehealth, especially at the Bantul District Health Center. **Method :**This study used a cross-sectional method to observe the technical readiness of Telehealth and its implementation at the Bantul District Health Center, by taking a sample of 27 Primary Health Centers throughout Bantul Regency, with an average of 27 respondents consisting of doctors, Heads of Health Centers, and Heads of Administrative Staff. The results of the questionnaire will be translated into data analysis to provide an overview of Telehealth readiness factors. The sampling technique uses total sampling from the questionnaire "Assessment of Readiness to Adopt Telehealth in Health Facilities". Data analysis using exploratory data analysis. **Result :**Out of a total of 27 Community Health Centers surveyed, 11 Primary Health Centers were found to have readiness below average, while 16 Primary Health Centers had Readiness above the overall average. The lowest Telehealth readiness factor is room readiness to conduct Telehealth, while the highest Telehealth readiness factor is the availability of internet facilities in the Primary Health Center area. Only 4 Community Health Centers have implemented teleconsultation in the form of video. **Conclusion :**Availability of Telehealth rooms at Primary Health Center needs to be improved in implementing Telehealth services

Key words: Technical Readiness; Technical Use; Characteristics of Primary Health Center; Use of Technology

INTRODUCTION

The Indonesian nation is a large nation spread across many islands and has a total of 265 million people. Indonesia is still a developing country, in developing countries there are still many things that must be considered, such as health problems that are not evenly distributed. The use and utilization of ICT in the health sector can facilitate online health services so that their use is not limited by distance and time (Ardiansyah & Rusfian, 2020). Telehealth is a health practice that is carried out using audio, visual and data communication which includes treatment, diagnosis, consultation and treatment, as well as the exchange of medical data and scientific discussions remotely (Jamil et al., 2015). The use of telehealth is also useful during the COVID-19 Pandemic as it is now where people are asked to avoid direct contact with other people to prevent the spread of the virus from becoming more widespread.

The importance of the role of telehealth in providing health services online makes researchers want to understand more deeply about its implementation. Implementing telehealth in health facilities requires several preparations, one of which includes technical readiness. In terms of technical readiness, several aspects are needed, namely hardware, software, network quality, as well as online service support consisting of telehealth usage guidelines and IT support services.

METHODS

This study uses a cross-sectional research design, in which the researcher observes the variables to be studied at a certain time. This research was conducted using the secondary data method which took the research of dr. Daniel CA Nugroho, MPH entitled "Assessment of Readiness to Use Telehealth for Health Facilities" and was implemented in all 27 Primary Health Centers in Bantul Regency. In this study, each Primary Health Center asked one respondent to fill out a questionnaire via a Google form containing 10 questions related to Telehealth technical readiness. Data analysis used exploratory data to summarize data related to what technical readiness factors the Primary Health Center has. The research was conducted after the issuance of the Ethical Clearance by the Faculty of Medicine at Duta Wacana Christian University with reference to ethical principles. Obtained for Ethical Clearance Number 1435/C.16/FK/2022.

RESULT

Table 1 Characteristics of Primary Health Center

<i>Characteristics of the Health Center</i>	<i>Characteristics average</i>	<i>Total per share characteristics</i>	<i>Information</i>
Number of Health Workers	40 people	-	The average number of Primary Health Center health workers is 40 people
Number of Administrative Personnel	8 people	-	The average number of administrative staff at the PHC is 8 people

Characteristics of the Health Center	Characteristics average	Total per share characteristics	Information
Age of health center staff	38 years	-	The average age of PHC staff is 38 years old
Online Queue	Already	21 Health Centers	A total of 21 health centers out of a total of 27 health centers already have online queues
Electronic Medical Records	Not yet	8 Health Centers	Only 8 health centers out of a total of 27 health centers have electronic medical records
Teleconsultation Write	Already	26 Health Centers	A total of 26 Primary Health Centers have conducted written teleconsultation
Video teleconsultation	Not yet	4 Health Centers	Only 4 Primary Health Centers have conducted video teleconsultation via Google Meet / WhatsApp video

Table 1 data describes the basic characteristics of each Primary Health Center which consists of 27 Primary Health Centers throughout the Bantul Regency. From the secondary data obtained above, it can be seen that there are several additional criteria in supporting telehealth presence which consist of online queues, electronic medical records, written teleconsultation, and video teleconsultation. In using video teleconsultation applications, it is necessary to pay attention to the protection of patient data, this has been regulated in the HIPAA law (Health Insurance Portability and Accountability Act), this law was created to protect patient privacy and health records, several applications already have HIPAA certification including Google Duet, Skype, Zoom, and Microsoft Teams.

Table 2 Profile of the Technical Readiness of the Health Center in Bantul Regency

Questionnaire Questions	Total Result of Each Question	Average Per Question	Average total of all Questions
Question 1 (P1)	91	3.37	3.31
Question 2 (P2)	87	3.22	
Question 3 (P3)	93	3.44	
Question 4 (P4)	98	3.63	
Question 5 (P5)	92	3.41	
Question 6 (P6)	97	3.59	
Question 7 (P7)	102	3.78	
Question 8 (P8)	89	3.30	
Question 9 (P9)	79	2.93	
Question 10 (P10)	66	2.44	

Table 2 above shows the statement of technical readiness which is represented by 10 questions with the following meanings:

1. Primary Health Center has hardware that can facilitate teleconsultation (P1)
2. Primary Health Center has software that can facilitate teleconsultation (P2)
3. Primary Health Center has a fast and stable internet network that can facilitate teleconsultation (P3)
4. Primary Health Center has technical support for the use of computers and internet networks (P4)
5. Primary Health Center have access to conduct training related to the use of technology (P5)
6. There is an adequate internet network at the health center (P6)
7. Primary Health Centers are able to provide internet facilities (P7)
8. Primary Health Centers have access to conduct training related to the use of technology (P8)
9. Primary Health Center has special personnel who are responsible for hardware, software and internet networks (P9)
10. Primary Health Center has a room suitable for telehealth (P10)

This statement will then be answered by selecting 5 options according to the following conditions:

- 1 = Veryit is not in accordance with,
- 2 = It is not in accordance with,
- 3 = Enough,
- 4 = In accordance,
- 5 = Veryin accordance

Table 3 Total Percentage of Answers for Each Question

	Total Percentage Per Answer in (%)									
	P1	P2	P3	P4	P5	P6	Q7	Q8	Q9	P10
STS	3.70	3.70	0.00	0.00	3.70	0.00	0.00	0.00	18.52	22.22
TS	14.81	14.81	11.11	7.41	11.11	7.41	7.41	18.52	7.41	25.93
C	40.74	48.51	48.15	40.74	40.74	40.74	29.63	44.44	44.44	37.04
S	22.22	22.22	25.93	33.33	29.63	37.04	40.74	25.93	22.22	14.81

<i>Total Percentage Per Answer in (%)</i>										
	P1	P2	P3	P4	P5	P6	Q7	Q8	Q9	P10
SS	18.52	11.11	14.81	18.52	14.81	14.81	22.22	11.11	7.41	0.00
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In Table 3 is a table of the total percentage of answers to each question which consists of 5 answers, namely STS (Highly Inappropriate), TS (Not Appropriate), C (Enough), S (Suitable), and SS (Very Appropriate). Based on table 2 above, namely the profile description of technical readiness at the Health Centers in Bantul Regency, it was found that the overall average for Health Centers in Bantul Regency was 3.31.

Table 4 Comparison of mean between Primary Health Center

Primary Health Center that have above average readiness	Primary Health Center that have below average readiness
16 Health Centers	11 Health Centers

Table 4 regarding the comparison of the average between those that exceed the average and less than the average is made to see the total technical readiness based on the questions that have been answered. Primary Health Centers that have an average below the institutional average mean that there are more things related to technical readiness that need to be improved, compared to the Primary Health Center which has an average above the average institution.

DISCUSSION

This first question refers to the readiness of the hardware owned by Primary Health Center in running Telehealth. The average total hardware readiness of all Health Centers in Bantul Regency is 3.37. Selection of hardware requires several requirements such as determining responsible staff, computers, printers and other peripheral devices as already written in the Health information system requirements (Regulation of the Minister of Health of the Republic of Indonesia, 2015). Obstacles in preparing the hardware were the factor that the internet in the Primary Health Center area was not yet fully stable, electricity was not sufficient, and the web service was considered immature. (Ayatollahi et al., 2014.).

The second question refers to the readiness of the system that is run by hardware. Total Software Readiness of all Health Centers in Bantul Regency is 3.22. Software plays an important role because it is responsible for carrying out functions such as network functions, control, access control, transmission, and can detect and fix errors and the security of a program. Some of the obstacles that often arise in the implementation of software readiness are relatively high costs for up-to-date technology, the process of mastering technology tends to be slow, there is still a lot of technological information that is considered unreliable, and there is an incoherence between software design and its use. (Sukoharsono Gianis, 2016).

The third question contains about Primary Health Center having a fast and stable internet network that can facilitate teleconsultation. The total average answer related to

the readiness of the Internet Network for all Health Centers in Bantul Regency is 3.44. A good and adequate internet network greatly influences the integration of data reports into health information (Asadi et al., 2015). The strength of the internet network in Bantul has an average value of 3.93 Mbps (Communication and Informatics Office of Bantul Regency, 2021.). Factors that can become an obstacle in the implementation of web-based electronic information systems are the lack of wireless connectivity to the internet network so that it has the effect of reducing the efficiency of service quality (Goldstein et al., 2014).

The fourth question contains about Primary Health Center has technical support for the use of computers and internet networks. From these results it was found that the average technical support readiness of the Bantul District Health Center was 3.63. Technical support is important because humans must be in control of a computer program, the computer only helps in processing an order given by humans (Sukoharsono Gianis, 2016). The obstacle faced by Primary Health Center is that there is no training for officers regarding the use of the Primary Health Center management information system (Christanti & Pratiwi, 2016).

The fifth question contains about Primary Health Center have access to conduct training related to the use of technology. From the results above, it is obtained that the average readiness of technology use training is 3.41. Obstacles that can be found such as relatively high training costs, members' slow mastery of technology, and the organization's lack of readiness in managing the change from paper-based to computer-based. (Sukoharsono Gianis, 2016).

The sixth question contains about there is an adequate internet network in the health center. From the results above, it is obtained that the average Adequate Internet Network Readiness at the Primary Health Center is 3.59. The average internet speed in the entire Bantul Regency is 3.93 Mbps so that with this almost all the Bantul District Health Centers can run telehealth applications safely without network constraints (Communication and Informatics Office of Bantul Regency, 2021.). Primary Health Center that run an electronic information system must have an application, an adequate internet network, and a local network (LAN).

The seventh question contains about Primary Health Center is able to provide internet facilities. Internet facilities in the Primary Health Center area are a must in the operation of electronic information systems (Permenkes RI, 2019). From the results obtained, it was found that the average readiness of the Primary Health Center in providing internet facilities was 3.78. Health services such as hospitals and health centers have an obligation to provide facilities and infrastructure in the form of adequate internet networks that can be useful in supporting the smooth operation of telemedicine services. (Permenkes RI, 2019). The obstacle faced in providing internet facilities at the Primary Health Center is the lack of infrastructure to support internet connections, unpreparedness in the infrastructure sector occurs especially in terms of fixed lines, this is because the majority of the population uses mobile cellular (Ruth, 2013), so it is believed that the use of wifi or hotspot facilities at the Primary Health Center is not well facilitated.

This eighth question has similarities with the fifth question which refers to the role of the Primary Health Center in preparing its members to study electronic-based information systems, but the eighth question is more directed to the access that the Primary Health Center has in conducting training, the access in question is a form of Collaboration between Primary Health Center and third parties. From the results obtained, it was obtained that the average value of answers related to the readiness of the Primary Health Center

in conducting training on the use of technology was 3.30. Community Health Centers are expected to cooperate with consultants or training institutions in developing user competencies (Sukoharsono Gianis, 2016). This aims to provide skills and knowledge that are expected to be able to develop health center staff insight into the application of computer software (Risnawati et al., 2020).

The ninth question contains about The Primary Health Center has special personnel who are responsible for hardware, software, and internet networks. The average result for obtaining answers related to special personnel who are responsible for hardware, software and internet networks is 2.93. Obstacles that can be found in its implementation such as the unpreparedness of the organization in management and the existence of obstacles in terms of costs incurred for maintenance which are quite high (Otto et al., 2020). Staff responsible for software are required to be able to control an application which is divided into three controls, namely input controls used to check the accuracy and completeness of data when running the program; processing control plays a role in ensuring data completeness and accuracy of data during the updating process; and output control which has the function of ensuring the results of a computer processing are accurate, complete, and properly distributed.

The tenth question refers to a special room used for consultations in the form of video conferencing. The average number of answers from the Community Health Center regarding the availability of rooms for Telehealth is 2.44. This study shows that there is still a lack of rooms used for conducting consultations via video conferencing at the Primary Health Center. On (Decree of the Minister of Health of the Republic of Indonesia., 2015.) stated that the implementation of telehealth requires a special room or facilities to implement video conferencing. Facilities which are buildings or rooms used in conducting telehealth services, can stand alone or even be separated from the service area.

The problem that still needs to be addressed by the Bantul District Health Center is the need to build facilities to run telehealth applications. The facility can be in the form of a special building or room that can be used to provide telehealth services. Development of Primary Health Center facilities can be done by allocating physical Special Allocation Funds (DAK). The physical DAK sub-sector in its function to fulfill telehealth facilities and infrastructure is the health system strengthening sub-sector, this aims to fulfill Primary Health Center facilities and procure Health equipment (PMK regarding Operational Instructions for the Use of DAK., 2022.).

This study has limitations such as data from this study obtained from secondary data so that researchers cannot conduct direct surveys to the Primary Health Center to see the condition of facilities and infrastructure in each Primary Health Center, and the use of the self-assessment method can also cause confusion.

CONCLUSION AND RECOMMENDATION

Conclusion

Primary Health Centers need to improve readiness regarding special personnel who are responsible for hardware, software and Internet networks. Besides that, the Primary Health Center also needs to provide a special room for adequate telehealth so that teleconference activities can be carried out without obstacles.

Recommendation

The next researchers are advised to conduct testing to compare the readiness of telehealth implementation during the pandemic and post-pandemic period to observe the development of telehealth in Primary Health Centers. Primary Health Centers can enhance their readiness in implementing telehealth even in the post-pandemic period. This is aimed at assisting the community in accessing healthcare services quickly. The improvement in readiness can be achieved by prioritizing the allocation of funds and implementing evaluations of the infrastructure and facilities supporting telehealth in Primary Health Centers. The Health Office of Bantul Regency can provide assistance to Primary Health Centers that require support in terms of infrastructure and facilities for telehealth, based on the evaluation results of the infrastructure and facilities in each Primary Health Center.

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NURSING MANAGER'S EXPERIENCE IN PREPARING NURSES FOR COMPREHENSIVE NURSING SERVICES IN THE POST-PANDEMIC PERIOD

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ABSTRACT

Background: The COVID-19 pandemic, with more than 499 million cases and 6.2 million deaths so far, has devastating consequences on health workers, healthcare systems, the world's population, and economies. The COVID-19 pandemic proved to be a challenging struggle; it brought some positive results. Nurses adopted an attitude of collaboration and support in their shared goal of providing patients with the best healthcare during the pandemic. Nurse managers are becoming more visible and effectively participating in organizational decision-making at different levels and gaining recognition from their peers, Specially when compared to pre-pandemic period, it can be seen that there are essential changes experienced in the problem-solving and retrieval processes decisions and nurses perceive these as opportunities for professional development. **Purpose:** This study aims to explore the perceptions and experiences of nursing managers from several levels in reorganizing comprehensive nursing services after the pandemic. **Method:** This study used qualitative methods with an interpretive descriptive approach through Focus Group Discussion (FGD) on 8 participants in private hospitals in Semarang with purposive sampling techniques. Data analysis used a systematic coding process that began with listening to the verbal descriptions of the participants, followed by reading and rereading verbatim transcripts. **Results:** The results of the study found four themes, namely (1) nurse human resource management, (2) nursing care service management, (3) financial management, **Conclusions:** Nursing managers are challenged in preparing nurses in the post-pandemic period by viewing crises as opportunities to record management deficiencies at the hospital level, starting with evaluating comprehensive management of nursing services and nursing care so that they are prepared to face ongoing emergencies.

Key words: COVID-19; post pandemic; nurse manager ; nursing management

INTRODUCTION

The frontline nurse's central role, heroism, and experience during the COVID-19 pandemic are gaining tremendous visibility and have permeated intense discussions and investigations worldwide (Freitas et al., 2021). A preliminary study of the impact of COVID-19 on nursing leadership in the United States, conducted in July 2020 by the American *Organization for Nursing Leadership* (AONL) and Joslin Marketing partnered to conduct a study on the impact of COVID-19 on nursing leadership with nearly 2000 nurse leaders.

Findings from interviews and online surveys identified key concerns, key challenges, enduring changes, and preparedness for future pandemics or surges, revealing the magnitude of the challenges, which included lack of manuals, shortages of protective equipment and supplies, ever-changing information, changes in cultural dynamics, and financial impact on staff. Nearly 15% of respondents said they were unprepared for a future pandemic or surge. The International Nursing Council and healthcare organizations must leverage nursing leadership to weather this health crisis and learn from the COVID-19 pandemic to prepare for the future (Joslin & Joslin, 2020).

In many countries, nurses work in the virtual environment of this pandemic, with insufficient resources or personal protective equipment, increasing patient numbers, staff shortages, ill-prepared health systems, and supply chain failures. Nurses and other health and emergency workers suffer physical and emotional stress and moral pressure from conflicting professional values. Serious problems during this pandemic have led to poor planning, preparation, organization, and leadership by some governments and health systems, including a failure to ensure an adequate supply of needed medical supplies, including personal protective equipment for nurses and others (Switzerland, 2021).

Nurses will continue to require strong moral courage and resilience to work during this COVID-19 pandemic in hospitals, clinics, nursing homes, and communities worldwide and across borders and cultures. There is no doubt that nurses continue to face care challenges in this pandemic, but they are ready to handle public health emergencies of this scale. Nurses need to debate and engage in policies to assist in their work and risk management during emergencies and disasters. They also need strong leadership, clear direction, and ongoing support from each other, their employers, communities, and their nursing organizations to protect society, save lives, and prevent suffering in this pandemic by analyzing issues and challenges. Lots of discussion within the profession and with other disciplines to be better prepared for public health emergencies. We all must protect and maintain the welfare and competence of nurses so that they, in turn, can carry out their roles and responsibilities in a professional manner (Sue et al., 2020).

METHOD

This study uses a qualitative method with a descriptive interpretative approach through Focus Group Discussion (FGD). This study studied the experience of nurses managing nursing services during a pandemic and preparing for post-pandemic services. This method is focused on implementing the management function based on the 5M study. Meanwhile, the surrounding phenomenon is the non-compliance that occurred during the pandemic. By Focus Group Discussion (FGD) through small groups so that everyone has the opportunity to share insights but large enough to provide a diversity of perceptions (Krueger & Anne Casey 2015).

RESULT

Table 1. Characteristics of Participants

Age	Frequency (f)	Position
45	P01	<i>Nurse Eksekutif</i>
40	P02	<i>Nurse Eksekutif</i>
41	P03	<i>Nurse Eksekutif</i>
39	P04	<i>Middle nurse</i>
38	P05	<i>Middle nurse</i>
29	P06	<i>Nurse manager / nurse supervisor</i>
30	P07	<i>Nurse manager / nurse supervisor</i>
31	P08	<i>Nurse manager / nurse supervisor</i>

Management of Resources

The theme related to nurses is the component of the availability of nurses which is concluded based on categories and keywords. The results of the study found that there were four categories of nurse availability components, namely 1) training, 2) availability of personal protective equipment, 3) room readiness maintenance, and 4) improving the quality of nursing care. The statements of some participants are as follows :

The theme related to nurses is the component of the availability of nurses which is concluded based on categories and keywords. The results of the study found that there were four categories of nurse availability components, namely 1) training, 2) availability of personal protective equipment, 3) readiness of treatment rooms, and 4) improving the quality of nursing care. The statements of some participants are as follows:

“.....training in the use of personal protective equipment and managing nurse human resources....” (P01)

“.....the division of shifts is carried out every working hour and evenly and in a balanced manner so that the recruitment of nurses must also be in accordance with the education of Nurses and D3 (P03)”.....the distribution is also according to specialization..... (P04)” division in the room must be based on specialization and competence and the field of nursing that is managed.” (P02)

“.....Training on prevention of infection control before entering the room is immediately given, at least regarding the installation of personal protective equipment and the situation of patients who experience infection...”(P05)” will be taught again, and introduced first what the layout is like, the basic layout of communication (P06)”.....the competence of nurses is very much needed in determining the conditions in service and guaranteeing quality standards of nursing services....”(P07)the competence of nurses is also determined based on self-concept and motivation which will be adjusted to the field of work needed by the hospital”(P08)”

Management of nursing care services

Quality evaluation during the Covid 19 era was a hospital service system which included Man, Money, Materials, Machines, and Method. There was an assumption that if the structure of the Hospital system was well organized, it would better guarantee the quality of nursing, the quality of the Hospital would certainly be good. . During the Covid 19 pandemic, the flow and structure and application of Man, Money, Material, Machines and Methods had to be clear and firm so that the service would be better, some participants in this study said that the implementation of Man, Money, Materials, Machines and Methods had been going well and follow the directions from the leadership and if there are problems they will report and learn again the application of Man, Money, Material, Machines and Methods so that there are no obstacles in evaluating Man, Money, Materials, Machines and Methods.

“... in our room sometimes we forget the method that must contain Man, Money, Material, Machines, and the rest we try to implement according to what is there.....”(P05)”

“...eee, just adjust it to see the conditions of the workplace, what Man, Money, Materials, Machines, and Methods can do” (P06)”.....evaluations regarding Man, Money, Materials, Machines, and Methods in the room are well organized, all that’s left is to fix it...”(P02) evaluation of the implementation of Man, Money, Materials, Machines, and Methods is rare there is a serious problem and the room is well organized in managing the room and the room staff just needs to be repaired a little bit related to standardization of nursing care and standard operating procedures that will be given after the pandemic and will be carried out....”(P04)”

Financial Management

The policy of the Indonesian government in providing Covid 19 incentives for medical teams serving people exposed to the corona virus. Providing this incentive is also a form of government appreciation for the willingness of medical personnel to help people exposed to the Covid 19 virus, which in essence are faced with very high risks. Thus the amount of incentives obtained by doctors is according to the level of risk they face.

“...yes I know” as the head of the room I manage the data for incentives provided by the government for nurses in the room “(P03)”

“.....when we wanted to start opening the COVID 19 room and we were informed that we received an incentive from the Ministry of Health, namely 1 person Rp. 7,500,000.....”(P04)

“... for now, I am the head of the room and the coordinator of services in the room.” (P06)

“... We can’t because we as civil servants also have a salary, we have other incentives, but if possible, adjust it according to what needs, don’t average it (P08)”

“...Ohh in financial terms. Maybe there is a service, so there is other income from this form of incentive (P02)”

DISCUSSION

In identifying each theme various criteria are obtained to be able to carry out the theme. Comprehensive nursing services require HR indicators that can manage them properly to produce a professional service. Nurses as frontline workers have a high level of anxiety in dealing with the crisis. For example, research on services in the pandemic era has shown that frontline health care workers who provide care for patients with COVID-19 are at greater risk of mental health problems, such as anxiety, depression, insomnia and stress (Liu et al., 2020). Ardebili et al. (2021) examined the experiences of healthcare providers during the COVID-19 outbreak in Iran. Findings reveal that healthcare providers are experiencing fundamental changes in their lives. They have a high level of workload and lose control of the situation. They experience an extensive range of negative emotions such as fear of passing the disease on to family members and fear of death. Frontline doctors and nurses who have no experience with infectious diseases face additional challenges while adjusting to a new work environment (Liu et al., 2020). Nursing leaders and managers are at the forefront of responding to the unique needs of healthcare providers during the COVID-19 crisis. They also have an important role to play in healthcare organizations in terms of understanding and leading staff to grow positively. Therefore, it is important for nurse managers to balance the needs of their organization, patients, team and internal resources to positively face the challenges of the work environment (Marrelli, 2017). Boitswarelo et al. (2020) confirmed that the role of the nurse manager is to achieve organizational goals by ensuring the planning and execution of treatment plans in the department. A nurse manager must be able to establish a safe and healthy work environment for staff. However, nurse managers are exposed to a variety of workplace challenges. Some of the challenges are related to scarcity of resources, staffing patterns, managing staff expectations, professional relations, and leadership skills (Adriaenssens, Hamelink, & Van Bogaert, 2017). As COVID-19 is a recent crisis, there is no qualitative study of the experiences of first-line nurse managers in Jordan. This lesson aims to explore the experiences of first-line nurse managers during COVID-19. The results can contribute to the existing literature by providing new information. Furthermore, exploring first-line nurse manager experience will assist in designing health policies and strategies to better deal with emerging crises and stressful situations such as COVID-19.

The unprecedented pressure and demanding new situation of working with COVID-19 patients is having a negative impact on the first line of life for nurse managers. Compensating for material and human resource shortages, gaining support from nurse administrators and colleagues, and conducting staff development programs are all important strategies for strengthening health systems and resilience. However, developing leadership competencies and self-awareness have positive consequences (Mansour, 2021)

Nurses have been recognized as fundamental actors in public health crises and have played a major role in the COVID-19 pandemic; However, the pandemic had a severe impact on nursing care. This is due to the challenges associated with preparedness and response to emergencies that multiple healthcare systems exhibit in different care settings (Marshall, 2021).

In facing a heavy workload, nurses must wear personal protective equipment (PPE) (Zhang, 2020) and are faced with a shortage of PPE (Morley, 2020), staff (Tan, 2020) and others. Nurses are also reported to be relocated due to changes in the allocation of human resources, having to quickly learn new skills and competencies, having to work with newly graduated nurses, and having difficulty communicating with patients and their families due to PPE and isolation. All of the factors mentioned above can influence personal care, which is an essential aspect of nursing, during the COVID-19 pandemic. The concept of personalized health nursing care is influenced by the environment of care and the ability of general nursing care to meet the needs of patients, who are inevitably affected by emergencies, thereby potentially influencing clinical outcomes and satisfaction with care.

CONCLUSION AND RECOMMENDATION

Nursing managers are challenged in preparing nurses in the post-pandemic period by viewing crises as opportunities to record management deficiencies at the hospital level, starting with evaluating comprehensive management of nursing services and nursing care so that they are prepared to face ongoing emergencies. Nurse managers can set standards to prepare for various types of emergencies so that they can be used properly

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DETERMINANTS OF SUSPECT TUBERCULOSIS COMMUNITY FACTORS IN THE BEHAVIOR OF UTILIZATION OF TUBERCULOSIS HEALTH SERVICES AT PRIMARY HEALTH CARES

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ABSTRACT

Background: The problem of tuberculosis is a problem that has not been resolved until now. Kaliwates Primary Health Care is one of them which still has not solved problems related to TB. based on data from Essential Public Health Efforts (UKM), namely the Percentage of Service indicator for people suspected of having TB getting TB services according to standards is still not achieved, which is 91% and the Success Rate for TB case treatment (Success Rate/SR) is 85% of the expected target 100%. In 2022 the Kaliwates Primary Health Care has achieved the discovery of people suspected of having tuberculosis by getting services according to standards, namely 698 (89%) people of the total targeted target of 784 (100%) so that there are still 86 (11%) people suspected of having TB who have not handled. One of the failures to achieve TB treatment rates is that there is still a low level of community access to TB services. **Purpose:** This can be influenced by several factors, namely the level of education, knowledge, attitude, role of cadres, JKN ownership, health information and accessibility. This research was conducted in January-February 2023 with the aim of research to find out the determinants of behavioral factors for the utilization of people suspected of having TB in utilizing TB services at the Kaliwates Primary Health Care. The type of research used was quantitative research with a cross-sectional design. **Method:** The sample size for this study was 51 respondents, which was conducted in 3 working areas of the Kaliwates Primary Health Care, namely Tegal Besar Village, Kaliwates Village and Kebon Agung Village. The sample selection technique is simple random sampling, the research instrument used was the interview guide. Data were analyzed univariately and bivariately using the chi-square test. **Conclusion :** The results show a relationship between the role of cadres (p-value=0.001), health information (p-value=0.037) and accessibility (p-value=0.001) and the behavior of TB service utilization at the Kaliwates Primary Health Care

Key words: Tuberculosis, determinant factors, utilization behavior, TB services

INTRODUCTION

Tuberculosis is a public health problem that has not been resolved both nationally and internationally. Based on the global tuberculosis report by the World Health Organization (WHO) for 2022, there are eight countries that account for two-thirds of tuberculosis cases globally, namely India (28%), Indonesia (9.2%), China (7.4%), the Philippines (7%), Pakistan (5.8%), Nigeria (4.4%), Bangladesh (3.6 %) and Democratic Republic of the Congo (2.9%). The group that contributed the most to TB rates were adult men (56.5%), adult women (32.5%) and children (11%) women (32.5%) and children (11%) (*World Health Organization, 2022:13*). Based on the World Health Organization (2021) tuberculosis is the 13th cause of death and the second killer of infectious diseases in the world, there are 1.5 million people who are estimated to have died from tuberculosis. Tuberculosis cases in Indonesia have increased from 2020 to 2021. Tuberculosis in 2020 was 351,936 and in 2021 it increased to 397,377 cases (Kemenkes RI, 2021:172).

Tuberculosis (TB) is a disease that can be transmitted directly caused by the bacterium *Mycobacterium tuberculosis* and most often attacks the lungs. TB disease can be transmitted through droplets, namely when TB sufferers experience coughing, sneezing, spitting and talking. TB bacteria can survive 1 to 2 hours in free air, this depends on the presence or absence of ultraviolet light, humidity and ventilation conditions, TB bacteria will last days to months if the living conditions are dark and damp (*World Health Organization, 2022:13*).

Based on the finding of tuberculosis cases in East Java province in 2021, which is 44%, this number is still below the national target set by Kementerian Kesehatan Republik Indonesia (Dinkes Provinsi Jawa Timur, 2021). Jember Regency is a district in East Java with findings of tuberculosis cases below the national target. Based on the health profile of Jember Regency, the findings of Tuberculosis cases in 2021 amounted to 3,036 people or around 54.4% (Dinas Kesehatan Kabupaten Jember, 2022). TB case finding is the main step taken to control TB, the more cases found, the more patients who get treatment, thereby reducing the transmission rate and death from TB disease.

TB disease can cause morbidity, disability and death, so efforts to control tuberculosis are needed. One of the strategies in efforts to tackle tuberculosis is by finding cases. Case finding is the first step in the activities of the Program Penanggulangan Tuberkulosis (P2TB) by maximizing early case detection to reduce morbidity and mortality from TB and prevent transmission in the community. This program is the most effective activity implemented in the community (Faradis and Indarjo 2018).

Optimal TB case findings are supported by the behavior of TB health service utilization by the community (Fatimah and indrawati, 2019) This is influenced by the characteristics of the community in utilizing the services of health facilities. There are several things related to the determinants of the utilization of health services by the community, including: knowledge, perception of illness, distance, transportation and health information. Knowledge and perception of illness are predisposing or driving factors that make people aware of the importance of early detection of tuberculosis, while distance, transportation and health information are the reasons a person is reluctant to access health services (Permatasari, *et al*, 2020).

Based on a preliminary study with the holders of the TB management program at the Kaliwates Primary Health Care, information was obtained regarding the problem of tuberculosis being a problem at the Kaliwates Primary Health Care, Jember Regency. Based on data from the Minimum Service Standards (SPM) for 2022 at the Kaliwates Primary Health Care, the indicator

for health services for people suspected of having tuberculosis has not been achieved, which is 88.90% of the target achievement of the 100% SPM. This problem is also found in the Essential Public Health Efforts (UKM), namely in the Disease Prevention and Control Services section of tuberculosis on the Service Percentage indicator for people suspected of having TB getting TB services according to standards (Minimum Service Standard 11) which is still not achieved at 91% and the number The successful treatment of TB cases (Success Rate/SR) is 85% of the expected target of 100%. In 2022 the Kaliwates Primary Health Care has achieved the discovery of people suspected of having tuberculosis by getting services according to standards, namely 698 (89%) people of the total targeted target of 784 (100%) so that there are still 86 (11%) people suspected of having TB who have not handled (Kemenkes RI, 2021:172) This is an obstacle for health workers to carry out early detection.

Based on the theory put forward by HL Blum, one of the biggest factors that influence the determinants of a person's health is explained, namely environmental factors, both physical, social and economic environment (Notoatmojo, 2014:65). Very dense environmental factors facilitate transmission which has an effect on increasing the number of TB cases. Communities with an environment close to TB suspected patients have a greater risk of contracting TB disease. Efforts to access health services are caused by several behavioral factors. Based on L.Green's behavioral theory, behavioral factors are divided into three namely predisposing factors, enabling factors and reinforcing factors (Notoatmojo, 2014:65).

METHOD

This type of research uses a type of quantitative research with a cross sectional approach. The cross-sectional study design was chosen to examine the correlation between risk factors and the effects of the results of data collection and was carried out once on the research subject (point approach). The cross-sectional method was used to determine the determinant relationship between the determinants of the community's aversion to TB suspects in the behavior of TB health service utilization at the Kaliwates Primary Health Care, Jember Regency. The population of this study were people suspected of having TB in three sub-districts in the working area of the Kaliwates Primary Health Care, namely Tegal Besar sub-district, Kaliwates sub-district and Kebon Agung sub-district, totaling 113 people. Samples were taken from the three sub-districts, namely 51 people. Sample calculation using the lambeshow formula. The inclusion and exclusion criteria from this study are as follows:

Table 1. Article inclusion and exclusion criteria

	Inclusion Criteria	Exclusion criteria
1	People who live in the sub-districts of Tegal Besar, Kaliwates and Kebon Agung, Jember Regency	People who do not live in the sub-districts of Tegal Besar, Kaliwates and Kebon Agung, Jember Regency
2.	People who have cough symptoms	People who do not have symptoms of cough
3	People who live close to TB patients	People who live not close to TB patients

RESULTS

Table 2. Characteristics of respondents

Characteristics	Category	Frequency	Percentage (%)
Residence	Kebon Agung Village	17	33.3%
	The big Tegal village	17	33.3%
	Kaliwates Village	17	33.3%
Gender	Man	10	19.6%
	Woman	41	80.4%
Age	20-35 Years	21	41.2%
	36-50 Years	20	39.2%
	51-65 Years	7	13.7%
	66-80 Years	3	5.9%

Table 3. Distribution based on level of education, knowledge, attitude, perception of illness, role of cadres, JKN ownership, health information, accessibility

Variable	Category	Frequency	Percentage (%)
Predisposing Factors			
Level of education	Tall	29	56.9%
	Low	22	43.1%
Knowledge	Tall	41	80.4%
	Low	10	19.6%
Attitude	Not good	20	39.2%
	Good	31	60.8%
Pain Perception	Not good	45	88.2%
	Good	6	11.8%
Reinforcement Factor			
Role of Cadre	Not good	17	33.3%
	Good	34	66.7%
Enabling Factor			
Ownership of JKN	Own	22	43.1%
	Do not have	29	56.9%
Health information	Seldom	47	92.2%
	Often	4	7.8%
Accessibility	Reachable	34	66.7%
	Hard to reach	17	33.3%

Table 4 Crosstab the relationship between Predisposing Factors and TB service utilization behaviour

Variable	Category	Behavior of Utilization of TB Services at the Kaliwates Primary Health Care				<i>P-Value</i>
		Not Utilizing		Utilise		
		N	%	N	%	
Level of education	Tall	23	45.1%	6	11.8%	0.117
	Low	13	25.5%	9	17.6%	
Knowledge	Tall	29	56.9%	12	23.5%	0.941
	Low	7	13.7%	3	5.9%	
Attitude	Not good	14	27.5%	6	11.8%	0.941
	Good	22	43.1%	9	17.6%	
Pain Perception	Not good	33	64.7%	12	23.5%	0.239
	Good	3	5.9%	3	5.9%	

Table 5. Crosstab the relationship between Reinforcing Factor and TB service utilization behaviour

Variable	Category	Behavior of Utilization of TB Services at the Kaliwates Primary Health Care				<i>P-Value</i>
		Not Utilizing		Utilise		
		N	%	N	%	
Role of Cadre	Not good	17	33.3%	0	0%	0.001
	Good	19	37.3%	15	29.4%	

Table 6. Crosstab relationship between Enabling factors and TB service utilization behaviour

Variable	Category	Behavior of Utilization of TB Services at the Kaliwates Primary Health Care				<i>P-Value</i>
		Not Utilizing		Utilise		
		N	%	N	%	
Ownership of JKN	Do not have Own	18	35.3%	4	7.8%	0.125
		18	35.3%	11	21.6%	
Health information	Seldom	35	68.6%	12	23.5%	0.037
	Often	1	2%	3	5.9%	
Accessibility	Difficult	17	33.3%	0	0%	0.001
	Easy	19	37.3%	15	29.4%	

Table 7. Reasons for Reluctance, Motivation, Respondents' Suggestions in Behavior Utilization of TB Services at the Kaliwates Primary Health Care

Reasons for Reluctance		
Category	Frequency	Percentage (%)
want to use	15	29.4%
very long distance	17	33.3%
Far	16	31.4%
unfriendly staff	2	3.9%
don't want to queue	1	2.0%
Motivation		
good service	24	47.1%
There isn't any	27	52.9%
Suggestion		
intensify counseling	8	15.7%
activation of Pustu Kebon Agung	10	19.6%
There isn't any	31	60.8%
does not discriminate between patients	2	3.9%

The frequency distribution of respondents in each village was taken as many as 17 respondents with a percentage of 33.3% each, with a total male sex of 19.6% and 80.4% female. The age category of 20-35 years was 41.2%, 36-50 years was 39.2%, 51-65 years was 13% and 66-80 years was 5.9%.

The results of the predisposing factors are the level of education, knowledge, attitudes, and perceptions of illness. Predisposing factors, namely respondents with higher education of 29 (56.9%) who do not utilize the service by 23 (45.1%) and who use by 6 (11.8%) while respondents with low education are 22 (43.1%) who did not use it were 13 (25.5%) and those who did were 9 (17.6%). The P-Value for the level of education is 0.117, namely >0.05 , which means that the level of education has no relationship with the behavior of using TB services. Respondents with high knowledge were 41 (80.4%) who did not utilize 29 (56.9%) and who utilized 12 (23.5%) while respondents who had low knowledge were 10 (19.6%) who did not utilize 7 (13.7%) and those who use it 3 (5.9%). The P-Value for knowledge is 0.941, namely >0.05 , which means that knowledge is not related to the behavior of TB service utilization. The attitude of respondent who were good was 31 (60.8%) who 22 (43.1%) did not use it and 9 (17.6%) did. The P-Value for attitude is 0.941, which is >0.05 , which means that attitude has no relationship with the behavior of TB service utilization. Respondents' perception of pain was not good by 45 (88.2%) who did not use it by 33 (64.7%) and who used it by 12 (23.5%), while the respondent's perception of pain was good by 6 (11.8%) who did not use 3 (5.9%) and 3 (5.9%) who did.

The reinforcing factor is the role of cadres. Respondents who rated the role of cadres as not good were 17 (33.3%) who did not take advantage of 17 (33.3%) and who made use of 0 while those who assessed the role of cadres were good were 34 (66.7%) who did not take advantage of 19 (37.3%) and those who use it are 15 (29.4%). The P-Value for the role of cadres is 0.001, which is <0.05 , which means that the role of cadres is related to the behavior of TB service utilization.

Enabling factors namely Respondents who have JKN are 22 (43.1%) who do not use JKN are 18 (35.3%) and those who do are 4 (7.8%) while respondents who do not have JKN are 29 (56.9%) those who did not use it were 18 (35.3%) and those who did were 15 (29.4%). The P-Value of JKN ownership is 0.125, namely >0.05 , which means that JKN ownership is not related to the behavior of TB service utilization. Respondents who often get information related to TB services are 4 (7.8%), 1 (2%) do not use them and 3 (5.9%) use them, while respondents who rarely get health information are 47 (92.2%) who did not use it by 35 (68.6%) and who did use it by 12 (23.5%). The P-Value of health information is 0.037, namely <0.05 which means that health information is related to TB service utilization behavior. Respondents who easily reached TB services at the puskesmas were 34 (66.7%) who did not utilize 19 (37.3%) and utilized 15 (29.4%) while respondents who found it difficult to reach TB services were (33.3 %) who did not use 17 (33.3%) and who used it was 0. The P-Value for accessibility was 0.001, which was <0.05 , which means that accessibility has a relationship with TB service utilization behavior.

The reasons why respondents did not want to access services were because the distance was very far 33%, far 31.4%, officers were not friendly 3.9%, did not want to queue 2% and none 29.4%. The motivation that causes respondents to want to access services is because the service is good 47.1% and no 52.9%. Input for TB services, namely intensifying counseling 15.7%, activating the sub-district Primary Health Care Kebon Agung 19.6%, not discriminating between patients 3.9% and none 60.8%.

DISCUSSION

The relationship between predisposing factors and TB service utilization behavior at the Kaliwates Primary Health Care

Predisposing factors include characteristics, knowledge, attitudes and beliefs (Notoatmojo, 2014:65). Based on the results of the study, the total number of respondents with low education was 56.9% and respondents with higher education were 43.1% with a p-value of $0.117 > 0.05$ which stated that there was no relationship between education level and TB services. Research conducted by Rokmah, (2013) explained that tuberculosis patients at the Jember lung hospital in the age range 0-34 years were more male. In contrast to the age range of 35-65 years, more patients are female. Whereas in patients aged 65 years and over there were no female patients at all.

Research conducted by Fatimah and indrawati (2019) explained that highly educated respondents prioritize health, so they seek big and good health services. This is because respondents with high education easily receive health information well, while respondents with low education are easily influenced by the surrounding environment. Therefore, a person's level of education is not always related to accessing health services, but knowledge and attitudes that always make a person access a health service. Knowledge is the result of

knowing someone about an object through the senses they have (eyes, hearing, smell, taste, etc.) (Notoatmojo, 2014:65). Based on the results of the study, it was found that those who had low knowledge were 19.6% and respondents who had high knowledge were 80.4%. Knowledge about health services can be caused by several things, one of which is health information and experience. Much information on health services was obtained from cadres and had experience in dealing with health workers. Respondents' low knowledge can be caused by respondents' ignorance of these health services, so they are reluctant to take advantage of them (Fatimah and indrawati, 2019). Respondents' poor knowledge was due to ignorance of the function of the puskesmas as a center for community development. Respondents who had less knowledge thought that the target of the puskesmas was only sick people. Meanwhile, respondents who have high knowledge will use the puskesmas as a means to obtain health services (Humairah, 2020).

Research conducted by (Rokhmah, et al., 2016) explained that one of the efforts to increase public knowledge about TB was by conveying material about TB and the side effects of OAT drugs using lecture methods or media that were easy to understand such as videos. Attitude is a person's closed response to certain object stimuli, involving emotional and opinion factors (Notoatmojo, 2014:65). Based on the bivariate test with pearson chi-square, it was found that there was no relationship between attitude and utilization of TB services at the Kaliwates Primary Health Care (p-value=0.941>0.05). This study contradicts research conducted by Fatimah and indrawati (2019) which attitude relates to the behavior of using health services.

Based on research Fatimah and indrawati (2019) person's attitude depends on the knowledge possessed. Communities who have experienced the clumsy Primary Health Care services can choose to continue to use or move to other services. Meanwhile, some people with a lot of people prefer to spend money rather than have to go far to the Primary Health Care clumsy and who have had problems with the Primary Health Care clumsy (service is not good, staff are not friendly, etc.). This condition causes a person to influence other people not to take advantage of the clumsy Primary Health Care services. This condition also occurs in the community in the working area of the Kaliwates Primary Health Care. However, there are some who actually want to access puskesmas services but the long distance makes someone reluctant to use them.

Based on the results of the study, it was stated that there was no relationship between perception of pain and behavior in utilizing TB health services with a p-value of 0.239. Research Irawan and Ainy (2018) which stated that there was no relationship between the perception of pain and the utilization of Payakabung Primary Health Care services with a p-value of 0.259. Other research Fatimah and indrawati (2019) conducted stated that there was no relationship between the perception of illness and the behavior of using JKN participants' health services. A small number of people at the Kaliwates Primary Health Care have a positive perception of illness and make health a top priority, so that they take advantage of health services not only when they are seriously ill.

Relationship between Reinforcing Factors and TB service utilization behavior at the Kaliwates Primary Health Care

Reinforcing factors or supporting factors include the attitudes and behavior of community leaders or health workers (Notoatmojo, 2014:65) In this study the researchers chose the role of the cadre, this is because the cadre is someone who is close to the community as an intermediary between health workers and the community. The role of cadres has

an important role in the utilization of community services. Cadres carry out their duties starting from before the implementation of the service, namely providing information about the availability of services, during the implementation of the service, namely helping health workers, after the activity, namely providing some counseling directly related to a disease or service and making reports on health service activities (Ughniyatul, 2016).

Based on the results of the bivariate test with the Pearson chi-square test, it was found that there was a relationship between the role of cadres in the utilization of services at the Kaliwates Primary Health Care (p -value = 0.001 < 0.05). This is in accordance with research conducted by Giena et al., (2021) that there is a relationship between the role of cadres and the utilization of elderly posyandu services (p -value = 0.029). Research conducted by Giena et al., (2021) explained that the role of good cadres makes people willing to access health services, but the process of becoming willing to utilize health services requires a process, this is due to the incessant process of providing service information, providing information related to services. Cadres cannot directly influence someone because cadres only help health workers and are not professionals. The condition of the community at the Kaliwates Primary Health Care is that many people take advantage of the service because the role of the cadres is good and really directs the community about the existence of services and directs examinations at the puskesmas. However, in Kebon Agung Kelurahan TB cadres are not well known so that the community does not know about services and some do not know about TB disease.

Relationship between Enabling Factors and TB service utilization behavior at the Kaliwates Primary Health Care

Enabling factors or supporting factors include the availability of facilities and infrastructure or health facilities for the community (Notoatmojo, 2014:65). Owning health insurance is an important thing that must be owned by the community because it can make it easier for people to get health services Fatimah and indrawati (2019). JKN ownership (p -value = 0.125) is not related to the behavior of utilizing TB health services at the Kaliwates Primary Health Care. This research is consistent with research (Notoatmojo, 2014:65) that there is no relationship between the perception of JKN ownership and the utilization of the clumsy Primary Health Care services with p -value = 0.704.

Communities in the working area of the Kaliwates Primary Health Care who have JKN utilize more health services than those who do not have JKN. According to the people who have JKN, the existence of JKN helps the community because they get free services with quite minimal contributions. This makes people feel calmer when there is a barrage of pain. Meanwhile, people who have JKN do not use it because their perception of illness is still negative, and when they are sick they are only treated at home with makeshift medicine, thus making JKN ownership of service utilization lower of Health information. The results of the study explain that there is a relationship (p -value = 0.037 < 0.05). Other research conducted Masita et al, (2015) also explained that there was a relationship (p -value = 0.012) between ease of information and health service utilization behavior.

Research conducted Fatimah and indrawati (2019) explained that the dissemination of health information related to services at the clumsy Primary Health Care was still low. So that some respondents did not know what services were provided, this affected the behavior of the use of health services at the Primary Health Care. This research is in accordance with the conditions of health information provided by the Kaliwates Primary Health Care for the community in the working area of the Kaliwates Primary Health Care. The people who often

get health information are the Kelurahan of Tegal Besar, for example, TB services, namely Kalitubec, the Kelurahan of Kaliwates, some of them know about TB services and in Kebon Agung Kelurahan no one knows about TB services. This is also related to the counseling efforts provided which are still lacking, even in the Kebon Agung Village there are some who do not know about TB disease.

Accessibility is the affordability that a person must achieve without being hindered by geographical, economic, social, language and organizational conditions (Masita et al,2015). The relationship between accessibility and TB services at the Kaliwates Primary Health Care is related (p-value = 0.001) this is in accordance with the Fatimah and indrawati (2019) And Masita et al, (2015) that there is a relationship between accessibility and health service utilization behavior. Based on the research conducted Fatimah and indrawati (2019) low utilization of puskesmas services due to lack of transportation facilities and long distances. Even though the treatment at the Primary Health Care is free, if you don't have a vehicle, you have to pay for transportation services. Expensive transportation costs make people use health services in other places, for example, the nearest doctor's practice or clinic.

Based on research Rumengan et al, (2015) health services in the JKN-BPJS program can free BPJS participants to choose health services other than the puskesmas. The existence of this freedom makes the puskesmas not the only place that must be visited. This is a solution for people who are far from the work area Primary Health Cares. This study describes the situation in the working area of the Kaliwates Primary Health Care. Community Primary Health Cares with the criteria of being far and very far tend to utilize the closest health services, for example in the Kaliwates Sub-District they access the services of Bina Sehat Hospital, Rolas Hospital, Jember Kidul Primary Health Care. The Kebon Agung Village has access to midwife practice services, nurse practice and the Sukorambi Primary Health Care.

Reluctance, Motivation and Suggestions in the Behavior of Utilizing Kaliwates Primary Health Care Services

Based on the results of data frequency, the reasons for people's reluctance to access health services were mostly due to very long distances (33.3%), having no reasons for reluctance (29.4%), not wanting to queue (2%) and unfriendly officers. (3.9%). Meanwhile, the reasons for someone's motivation to access services at the Kaliwates Primary Health Care are 47.1% assuming good service and 52.9% not having the motivation to access, this lack of motivation is because some still haven't experienced the services at the Kaliwates Primary Health Care at all.

Some of the suggestions that the researchers concluded from the interview results, namely in the Kebon Agung Sub-District expect that there will be counseling on a disease and various health services at the Kaliwates Primary Health Care (15.7%) as well as the activation of the Kebon Agung Sub-district sub-district Primary Health Care (19.6%), so that people can reach health services. from the Kaliwates Primary Health Care. There were some respondents who did not give advice (50.8%) and hoped that health workers would be more friendly and not discriminate between patients (3.9%).

CONCLUSION AND RECOMMENDATION

Conclusion

The results of the study using the Pearson chi-square test showed that the results of the predisposing factors, namely knowledge, attitude, perception of pain, were not related to the utilization of TB services. The reinforcing factor, namely the role of cadres, has a relationship with the utilization of TB services. Enabling factors, namely JKN ownership, are not related, while accessibility and health information are related to the utilization of TB services.

The community's reluctance to access health services is largely due to the distance that is too far. However, different from one's motivation, it shows that the majority of people have received good service.

Recommendation

Suggestions are expected, especially for the local government (kelurahan/kecamatan) which is very far from the primary health care, so by reactivating the supporting primary health care and providing complete information to the community regarding TB services at the Kaliwates Primary Health Care. Suggestions for Kaliwates Primary Health Care staff are to provide training for TB cadres in interacting with suspected TB patients (TB suspects) and positive TB patients, especially activating TB cadres in the Kebon Agung sub-district. For further researchers.

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