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## Original Research

# Analysis Need Education for Postpartum Mothers

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### ABSTRACT

**Background:** Postpartum mothers need education to maintain themselves and their babies. Only a little study about material education is based on what a mother and husband need. The study aims to explore the need for education for postpartum mothers and identify materials, methods, and educational media needed by postpartum mothers.

**Methods:** This study employed mixed methods with a sequential exploratory design. Stage 1 was done through a qualitative study with in-depth interviews with the seven participants using purposive sampling. Analyze the data with thematic deductive analysis. The quantitative phase used 300 postpartum mothers with a purposive sampling technique. An instrument study questionnaire was prepared by researchers, and a trial was conducted on 50 respondents with valid and reliable results. Quantitative data analysis with descriptive analysis

**Results:** It found six themes, namely "education to take care of a mother," "education needs to take care of a baby," "time-giving information," "methods of providing education," "educational media," and "sources of information." The most needed maternal care educational material is about breastfeeding ( $4.55 \pm 0.531$ ), breast care ( $4.46 \pm 0.531$ ), and mental health ( $4.45 \pm 0.584$ ). Material related to baby care that is mainly needed is immunizations ( $4.59 \pm 0.493$ ), signs and dangers of newborns ( $4.55 \pm 0.685$ ), and umbilical cord care ( $4.53 \pm 0.557$ ). The media chosen by the mother are online media and video. Direct education method by health workers. Timing of education during pregnancy.

**Conclusion:** Giving education should be customized with materials needed by the mother. Education will succeed if supported by educational media, appropriate methods, and time in education and carried out by healthcare professionals.

### ARTICLE HISTORY

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## INTRODUCTION

The maternal mortality rate indicates a successful effort to protect the mother. Nationally, the Maternal Mortality Rate (MMR) has decreased from 346 deaths per 100,000 KH in 2010 to 189 deaths per 100,000 KH in 2022. MMR in Indonesia is still

the highest in Southeast Asia as well. It is still far from global targets for reducing the MMR to 183 per 100,000 KH in 2024 and less than 70 per 100,000 KH in 2030 (Kementerian Kesehatan RI, 2022).

In 2020, the MMR in Bali Province was 83.8 per 100,000 live births. It increased compared to 2019, which was 67.6 per 100,000 births. The MMR in Badung Regency in 2020 exceeded the number in Bali Province, at 114 per 100,000 births. This is a significant increase from 2019; it was 28.15 per 100,000 births (Dinkes Kab. Badung, 2021). About 76% of deaths occur in the delivery phase and postpartum labor, with a proportion of 24% during pregnancy, 36% during the time of delivery, and 40% post-labor (Kemenkes RI, 2021).

The postpartum period is the period after labor until six weeks. Postpartum mothers are one of the vulnerable groups who experience mental disturbance because pregnancy experiences complex and fraught changes and challenges. The previous study (Suzuki, 2020) showed a lack of relationship between mother and baby after one month. Another study Fernandes et al., (2021) showed that mothers who gave birth during the pandemic showed awareness and low emotionality in children, which disturbed the bond between emotional mother and baby.

There are existing limitations in terms of mother, husband, and healthcare during the COVID-19 pandemic. Knowledge of postpartum mothers about postpartum care is still low (Wulandari et al., 2020). One is because they did not read the KIA book that was given to them. Research conducted by Maryam in 2021 proves this: there is still a lot of postpartum culture in the assessed community that is not in accordance with the principle of health or even has an impact on poor health, which is profitable for the postpartum mother and her baby (Maryam, 2021). According to Manurung (2021), mothers need information about prevention and treatment during pregnancy, childbirth, and postpartum (Manurung, 2021). The research results of Asmuji and Diyan, (2014) found that postnatal education becomes an alternative and the right choice for officer health to prepare mothers postpartum in adapting operating tasks for future developments (Asmuji & Diyan, 2014).

There is a lot of research on postpartum care, particularly maintenance breastfeeding, such as the study by Njakatara et al., (2021) about how education, health packages, and intelligent mother breastfeeding influence enhancement efficacy (Njakatara et al., 2021). According to the results of Nazari's research (2018) in Bojnourd, Iran needed necessary education for postpartum mothers, which included physical recovery and sexual and mental needs (Nazari et al., 2018). Allowing mothers to choose the topic to be discussed will help increase interest and satisfaction in the education provided, rather than topic education customized with the existing agenda (Rodrigues et al., 2014).

In Indonesia, there has been a lot of research done to increase the knowledge, attitudes, and actions of mothers about postpartum care. However, we have not yet found research that examines the required materials for postpartum mothers based on the perceptions of the mother and husband. Postpartum education materials, methods, and media are provided. Still, nature is general according to the house agenda, sick, and not yet by the need for necessary education. The study's goal is to examine the need for postpartum mothers to receive education and to identify the types of education they require-method education, educational media, time-giving education, and source information.

## **MATERIALS AND METHODS**

The design study used *mixed methods* with *sequential exploratory design* (Amir-Behghadami & Sadeghi-Bazarghani, 2021). This approach can be widely employed in situations where a researcher possesses limited familiarity with the primary concepts under investigation, as well as in cases where a valid and reliable instrument for assessing the intended construct is unavailable. This approach entails the utilization of both qualitative and quantitative methodologies in conjunction to investigate intricate phenomena.

The integration of both qualitative and quantitative approaches enhances comprehension of the subject matter, and the findings derived from the qualitative method can contribute to the advancement of the quantitative method. The method must be designed in two distinct phases, with each phase consisting of multiple steps.

### **First Phase**

#### ***Study design***

A qualitative descriptive (Colorafi & Evans, 2016) study was done to dig into problems, ways of handling, and needs for education in the postpartum period. The principal investigator (PI) has experience in qualitative studies and has been an expert on maternal nursing for more than 20 years. Two research members have several years of experience in qualitative research.

#### ***Sampling***

A total of seven participants were selected using the purposive sampling technique. Inclusion criteria were postpartum mothers and couples who live permanently in the South Kuta Public Health Center, postpartum mothers who can read and write, and postpartum mothers who are willing to be respondents. Postpartum mothers who experience psychological disorders were excluded.

#### ***Data Analysis***

The data were analyzed using thematic deductive analysis (Braun & Clarke, 2012). The thematic analysis method developed by Braun and Clarke is a cyclical procedure that encompasses six distinct stages: (1) gaining familiarity with the data, (2) creating codes, (3) developing themes, (4) reviewing themes, (5) defining and labeling themes, and (6) identifying exemplars.

#### ***Rigor and Trustworthiness***

The researchers employed specific guidelines to enhance the rigor and establish reliable criteria to ensure the methodological integrity of the study. The researchers employed the evaluation methods proposed by Guba and Lincoln, (1989) which involved establishing long-term communication with the participants and maintaining transparency regarding the study's objectives. Additionally, the researchers conducted a thorough analysis of the collected data, engaged in discussions with the participants regarding emerging themes, and made adjustments to the identified themes based on participant feedback (Polit & Beck, 2017).

The aforementioned procedures were recorded in Excel spreadsheets to guarantee the verifiability and reliability of the data. Additionally, the final report incorporated participant descriptions to exemplify the relevance and practicality of the study's

outcomes. In addition, to establish the study's credibility, participants were provided with a comprehensive summary and diagram of the research process, and member checks were carried out. Furthermore, the study incorporated the expertise of qualitative research and nursing leadership specialists to enhance the precision of the findings. Transferability was ensured through the provision of a comprehensive explanation of the study's context, background, and stage in the introduction. Additionally, participants were selected in a manner that maximized the potential for significant variance.

### ***Pilot Testing***

After the questionnaire was developed, a pilot study was carried out on 50 respondents at the Mengwi I Public Health Center, Badung Regency. The test results of the questionnaire found a mark validity  $p$ -value  $< 0.05$ , so the questionnaire was declared valid. *Cronbach's alpha* value is 0.73 ( $>0.6$ ), so the questionnaire stated reliability.

The questionnaire consists of characteristics of the respondent and husband, material education about maintenance mothers, maternal education about maintenance babies, source information, time-consuming information, information media, and methods of education. A Likert scale with 5 options: very important (5), important (4), unsure (3), not important (2), and very not important (1).

## **Second Phase**

### ***Study Design***

A quantitative descriptive study was used to answer the second objective of the study with a *cross-sectional approach*. The population study consists of postpartum mothers in the work areas of the South Kuta and North Kuta Community Health Centers.

### ***Sampling***

A total of 300 respondents were recruited regarding sample size and calculation (Pourhoseingholi et al., 2013). A collection sample was taken with the technique of purposive sampling. The inclusion criteria for this study encompassed postpartum mothers and couples who are permanent residents of the South Kuta Public Health Center. Additionally, postpartum mothers were required to possess the ability to read and write, as well as express their willingness to participate as respondents. Mothers who undergo postpartum and encounter psychological disorders were not included in the study.

### ***Data Collection***

The data collection procedure was started after receiving ethics approval from the Commission Ethics Study Health Polytechnic Ministry of Health Denpasar with the number LB.02.03/EA/KEPK/0493/2023. PI contacted the head of the public health center to determine the purpose of the study. After getting a permit, the PI and research member coordinate with the Maternal Program Coordinator at each public health center. The coordinator helps the PI and research member distribute the questionnaire to the patient. The completed questionnaire was gathered by the research members. Data was collected from May 2023 to October 2023.

### *Data Analysis*

Quantitative data analysis in a way that is descriptive To get the mean, median, mode, and standard deviation, we can determine material priority education according to the needs of postpartum mothers and husbands.

## **RESULTS**

The results were divided into a qualitative study (phase 1) and a quantitative data analysis (phase 2).

### **1. Qualitative Results**

Referring to the results of qualitative data analysis, we found six themes, namely "needs," "education about maintenance mothers," "necessity," "education about maintenance babies," "time-giving information," "method-giving education," "educational media" and "sources information."

#### *Education needs to take care of the mother*

Three participants stated that education about mental health for postpartum mothers is the most important thing.

"After giving birth, the most important thing is a mother's mental health. It is because her mother is mentally healthy and can take care of the baby properly." (R1, 26 years old, high school education, housewife job, primiparous, normal delivery)

Respondents 3 and 4 stated that, in addition to mental health, education about breast maintenance and breastfeeding is required.

"All important. Perhaps a mother who just had a child will have mental problems and others related to health, such as breast milk production or swollen or not. If it's something else, adapt, and just do it." (R3, 28 years old, bachelor's degree, private job, multiparous, normal delivery)

The labor section needs to educate mothers who have gone through it about baby maintenance and the operation.

"Just talked to avoid infection" (R6, 28 years old, high school education, housewife job, primiparous, gave birth to SC)

#### *Education needs to take care, baby*

Required educational materials about baby maintenance include maintenance of baby yellow (hyperbilirubinemia), treatment of the navel, and caring for the skin of babies.

"My baby Niki ever, just... like a bit yellow. When control is given to the doctor, it is just done. Simply do this. There was no phototherapy. They only checked blood after the doctor said they didn't need it; they were only given medicine and told to give breast milk every 2 hours because the baby was new, he said."

"I realized if the baby was yellow... recommended for sunbathing and giving breast milk every 2 hours." (R5, 36 years old, bachelor's degree, work as a housewife, multiparous, normal delivery).

Postpartum mothers require education about the maintenance rope center in addition to the maintenance baby yellow.

“My baby was a little yellow, but the doctor said nothing because it was still normal. If it were me, there wouldn't be one, maybe because of the second one. There was a lot of concern, but after consulting for some information, I was able to relax. It is important to take care of myself because I was scared the first time. I am scared of sudden dislodging or infection if we take care of it wrongly. The same possible education, baby yellow, you see, is rarely given, as I recall. If my second child did not turn yellow, maybe I don't know anything.” (R3, 28 years old, bachelor's degree, private job, multiparous, normal delivery)

Participants will also require information on baby skin care.

My baby got time spots yesterday because I put on powder that wasn't appropriate. I told the midwife not to use powder when I brought it to her because there were so many spots. The game is over if no powder is applied after that. (R2, 28 years old, last completed junior high school, housewife job, multiparous, normal delivery)

### ***Time-giving information***

Almost all participants agreed that the best time to educate is when they are pregnant.

“That was important to me even before I became pregnant. Let us prepare if you can so that later, you will not be in a rush like that after being pregnant. After giving birth, we can be mentally ready. So right, everything is safer.” (R1, 26 years old, bachelor's degree, housewife, primiparous, normal delivery)

“When I was pregnant, it was clear, right?” We can prepare for it before engaging in combat. Who knows if it is possible to remember after giving birth? We lose sight of it. (R3, 28 years old, bachelor's degree, private job, multiparous, normal delivery)

### ***Methods of providing education***

The preferred educational method of the participant is directly and immediately grouped.

“In my opinion, before getting pregnant, it's important so that we can prepare. If we can prepare, we won't be in such a rush after pregnancy after giving birth. If we can be mentally prepared and everything is ready, it will be safer for everything.” (R1, 26 years old, bachelor's degree, housewife, primiparous, normal delivery)

Participant 4 also stated the method in a way that directed more likes to the person.

“I like to just go straight to the person; sometimes via WA, it's not clear. It's not nice if you ask a lot of questions on WA. It looks like you're being too chatty (Mother chuckles), so face-to-face with the person giving the education is more effective, I think.” (R4, 28 years old, bachelor's degree, job private, multiparous, normal delivery)

Apart from methods in a way, there are also more participants, such as a group providing education in a way.

Face-to-face is better, so you can ask questions and get answers straight away. It's better for the health workers; you can group, so you can all come together (R3, 28 years old, bachelor's degree, private job, multiparous, normal delivery)

### ***Educational Media***

Educational media is desired, according to survey participants.

“I used to get an education through leaflet media while pregnant, but there is no media now. So, I have to look for information myself. Yes, I am familiar with the leaflet; I give it once in a while when pregnant, if after giving birth, most often through communication with friends or relatives. Yes, as I previously stated, I enjoy looking for information on social media when no one else is aware of it.” (R3, 28 years old, bachelor's degree, private job, multiparous, normal delivery)

More people prefer video media. The first thing we can be certain of is that demonstrations are also live on video.

“I read alone, am lazy, and occasionally lack health knowledge. That is something that no one understands. Yes, non-health professionals do not understand the language. So I don't understand enough.” (R1, 26 years old, bachelor's degree, housewife, primiparous, normal delivery)

### ***Source information***

Respondents are the source of the desired information. See a variety of doctor specialists in midwifery and beyond midwifery for more information. Families or friends, according to participants, can be completely trusted.

“For me, I often go to a gynecologist, so maybe I prefer a doctor. But midwives are also experts, right? Ordinary nurses or doctors might know, but they don't know as much as specialist doctors and midwives. But everything is possible. Is it family or friends? It depends. If I see that he has experience, for example, having children or something related to his work, I may believe him, but not immediately. It's the same with the family; sometimes they take care of it; the old version, if it makes sense and isn't dangerous, I also follow it” (the mother answered with a smile).” (R3, 28 years old, bachelor's degree, job private, multiparous, normal delivery).

“If me, I prefer to go directly to the specialist or midwife. Might be after those, nurse.”(R5, 36 years old, bachelor's degree, work as a housewife, multiparous, normal delivery)

## **2. Quantitative Results**

### **Characteristics Respondent**

**Table 1.** Characteristics Respondent

<b>Characteristics of Postpartum Mothers</b>	<b>Amount (n= 300)</b>	
	<b>Qty</b>	<b>%</b>
<b>Age</b>		
< 20 years	9	3 %
20-25 years	291	97%
<b>Last education</b>		
Elementary School	23	7.7%
Junior high school	21	7%
Senior high school	177	59%
Diploma/bachelor	79	26.3%



Characteristics of Postpartum Mothers	Amount (n= 300)	
	Qty	%
<b>Work</b>		
Housewife _	147	49%
Civil servants	4	1.3%
Private	132	44%
Self-employed	9	3%
Etc	8	2.7%
<b>Parity</b>		
Primiparous	91	30.3%
Multiparous	199	66.3%
Grand multiparous	10	3.3%
<b>Long Married</b>		
< 5 years	213	71%
5-10 years	67	22.3%
> 10 years	20	6.7%
<b>How to give birth</b>		
Normal	109	36.3%
Operation Section	191	63.7%
<b>Place Labor</b>		
Hospital / clinic giving birth	245	81.7%
Practicing midwife	52	17.3%
Public health center	3	1%

According to the data presented in Table 1, the majority of respondents (97%) fall within the age range of 20–25 years. In terms of educational attainment, the highest percentage of respondents (59%) reported having completed high school. The occupation most commonly reported by the respondents was housewife (49%). Additionally, a significant proportion of respondents (66.3%) reported having experienced multiple childbirths. The majority of respondents (71%) reported being married for less than 5 years. Regarding the method of labor, a substantial portion of respondents (63.7%) underwent a cesarean section. Furthermore, the vast majority of respondents (81.7%) gave birth in a hospital or clinic setting.

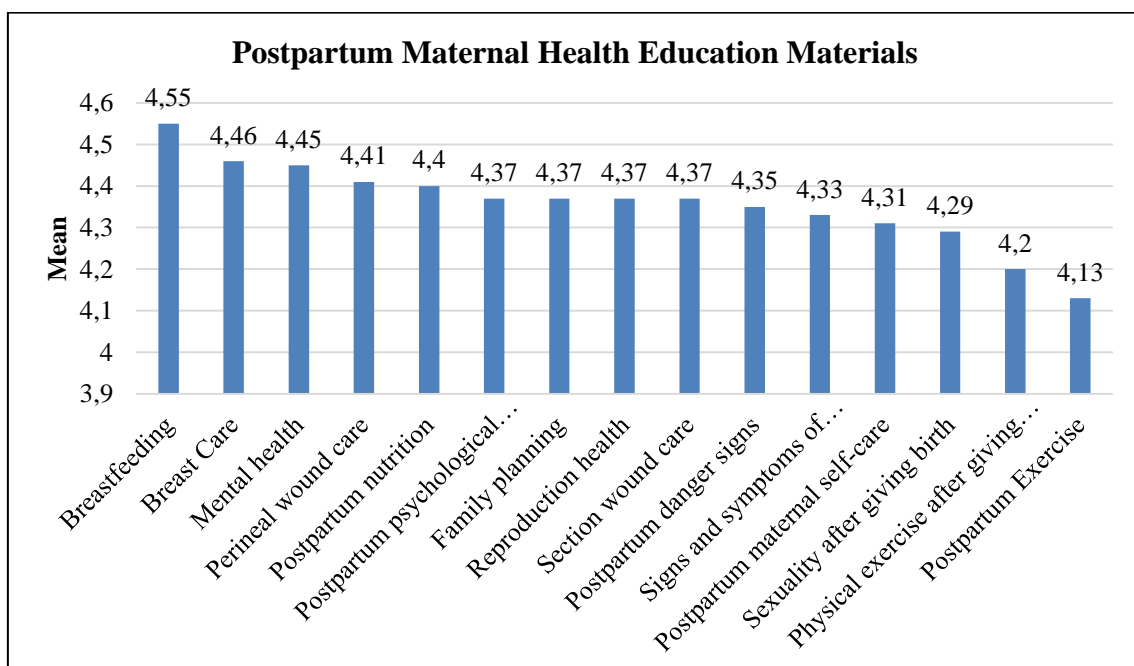
### Characteristics of Respondents ' Husbands

**Table 2.** Characteristics of Respondents' Husbands

Characteristics of Respondents ' Husbands	Amount (n= 300)	
	Qty	%
<b>Age</b>		
< 20 years	6	2 %
20-25 years	249	83%
>35 years	45	15
<b>Last education</b>		
Elementary school	24	8%
Junior high school	13	4.3%

Senior high school	178	59.3%
Diploma/Bachelor	83	27.7%
Master	2	7%
<b>Work</b>		
Civil servants	29	9.7%
Private	231	77%
Self-employed	40	13.3%
<b>Income family</b>		
< IDR 2,700,000	32	10.7%
≥ IDR 2,700,000	232	77.3%

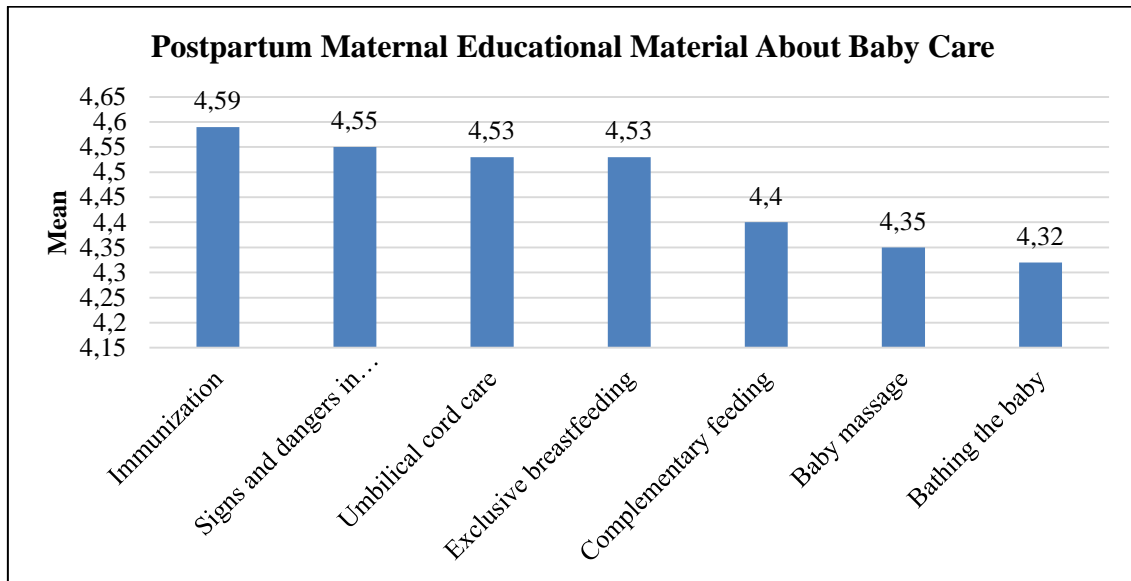
According to the data presented in Table 2, a significant proportion (83%) of the husbands surveyed fell within the age range of 20–35 years. This trend was particularly prominent among respondents who had completed their education up to the high school level (59.3%). Furthermore, a substantial majority (77%) of the respondents were employed in the private sector, and a similar proportion (77.3%) reported earning an income that exceeded the minimum wage set by the Badung Regency. The accompanying image displays educational resources about postpartum maternal health that are essential for mothers.



**Figure 1.** Educational material regarding postpartum maternal care

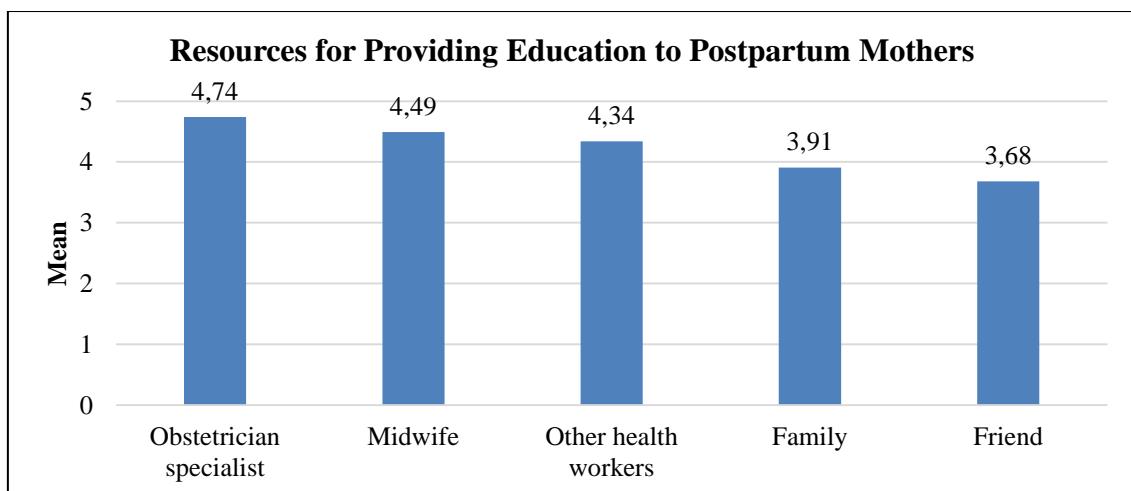
Figure 1 illustrates the average responses of the respondents, indicating a unanimous need for educational material during the postpartum period. Specifically, the respondents expressed a high demand for information regarding breastfeeding (mean =  $4.55 \pm 0.531$ ), breast care (mean =  $4.46 \pm 0.531$ ), mental health (mean =  $4.45 \pm 0.584$ ), perineal wound care (mean =  $4.41 \pm 0.580$ ), and nutrition for postpartum mothers (mean =  $4.40 \pm 0.578$ ). The five items deemed to have the least importance are the identification and manifestation of postpartum infection signs and symptoms (mean =

4.33, standard deviation = 0.561), maternal self-care during the postpartum period (mean = 4.31, standard deviation = 0.555), resumption of sexual activity after childbirth (mean = 4.29, standard deviation = 0.600), engagement in physical exercise following childbirth (mean = 4.20, standard deviation = 0.562), and participation in postpartum exercise (mean = 4.13, standard deviation = 0.578).  
 The accompanying image displays educational resources pertaining to infant health that are essential for postpartum mothers.



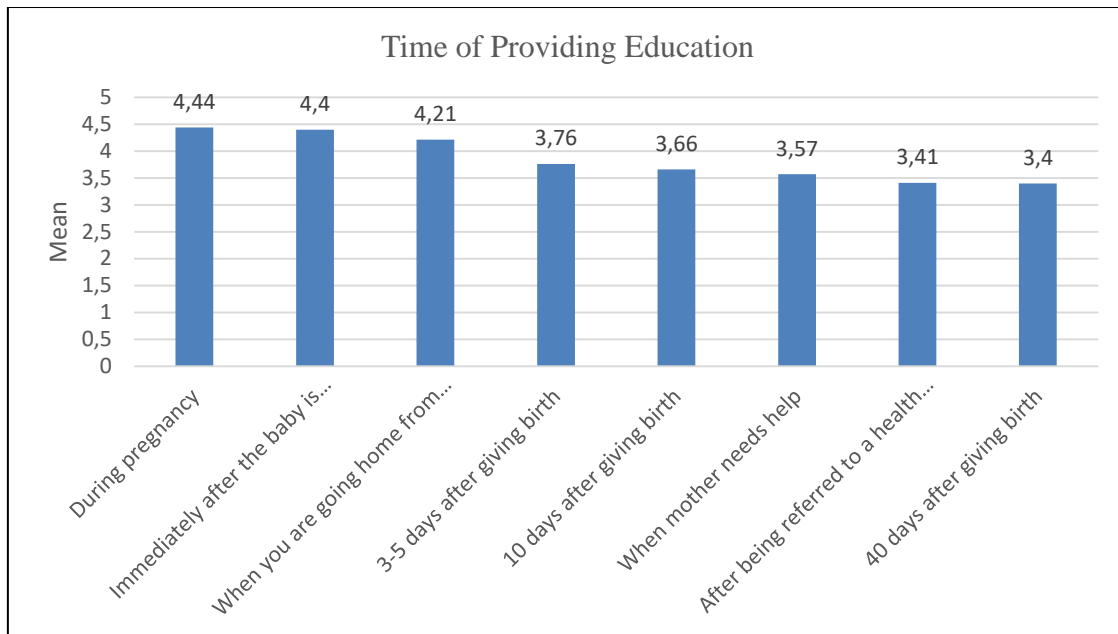
**Figure 2.** Educational material about caring for newborns

According to the findings presented in Figure 2, there is a significant demand for educational resources pertaining to infants among postpartum mothers. The essential components of baby care include immunization (mean score:  $4.59 \pm 0.493$ ), identification of signs and risks in newborns (mean score:  $4.55 \pm 0.685$ ), proper care of the umbilical cord (mean score:  $4.53 \pm 0.557$ ), and the practice of exclusive breastfeeding (mean score:  $4.53 \pm 0.557$ ).



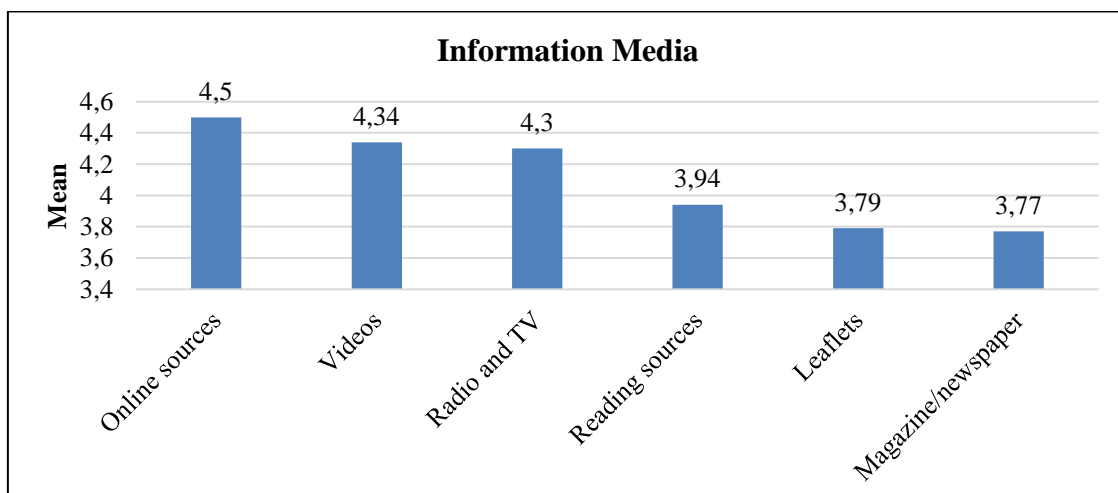
**Figure 3.** Sources of Postpartum Education information

Based on the data presented in Figure 3, it can be observed that health workers, particularly specialist doctors, are anticipated to be the primary sources of educational information (mean =  $4.74 \pm 0.463$ ). Following closely are midwives (mean =  $4.49 \pm 0.507$ ) and other health workers, including general practitioners and nurses (mean =  $4.34 \pm 0.520$ ).



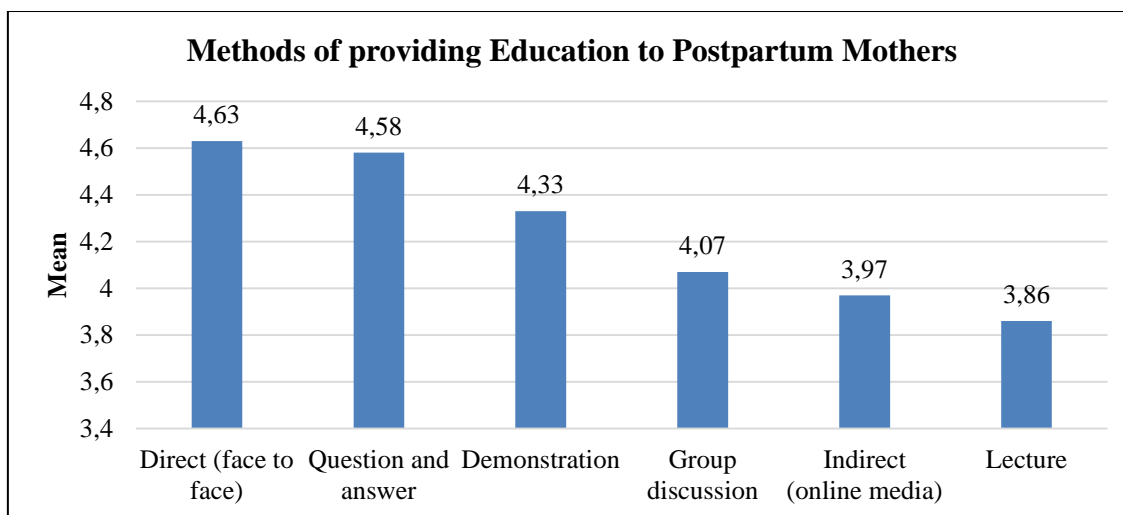
**Figure 4.** Delivery Time Postpartum Education

According to the data presented in Figure 4, it can be observed that the optimal time for information provision is during pregnancy, with a mean score of  $4.44 \pm 0.612$ . Subsequently, the second most prevalent time for information dissemination is immediately after the baby's birth, with a mean score of  $4.40 \pm 0.529$ . Lastly, leaving the health facility is identified as another significant time for information delivery, with a mean score of  $4.21 \pm 0.589$ .



**Figure 5.** Postpartum Education Media

According to the data presented in Figure 5, it can be observed that the anticipated means of disseminating information predominantly involve online platforms such as YouTube and Google (mean = 4.50, standard deviation = 0.558), followed by video formats (mean = 4.34, standard deviation = 0.600) and radio/TV broadcasts (mean = 4.30, standard deviation = 0.534).



**Figure 6.** Method of Providing Postpartum Education

Based on the data presented in Figure 6, it can be observed that the anticipated approaches for conveying information include direct communication (mean = 4.63, standard deviation = 0.503), question and answer sessions (mean = 4.58, standard deviation = 0.521), and demonstrations (mean = 4.33, standard deviation = 0.718).

## DISCUSSION

The findings of the qualitative data analysis, which involved conducting in-depth interviews with postpartum mothers, revealed the presence of six overarching themes. These themes include the importance of educating mothers on self-care, the significance of educating mothers on infant care, the role of timely information dissemination, the various methods employed for providing education, the utilization of educational media, and the sources of information accessed by mothers. The findings of the research study This aligns with the findings of a study conducted by Nazari et al., (2018) wherein they identified four primary categories of educational needs, namely "maintenance and restoration of physical health," "sexual health needs," "mental health needs," and "educational barriers."

Based on the findings of quantitative studies, it has been observed that the most prevalent educational requirement among mothers pertains to the maintenance of their own well-being and breastfeeding practices. Conducting a predominantly qualitative investigation. The aforementioned study, which was carried out in Ghana, discovered The discussion group centers around six primary themes that have emerged. 1)The provision of care with a focus on the needs of infants during the postpartum period; 2)The implementation of postpartum practices; 3)Limited understanding regarding the indicators of postpartum complications; 4)Challenges encountered in obtaining postpartum services. According to Adams et al., (2023) individuals may encounter

challenges related to their mental well-being and may require educational support after giving birth.

Extensive research has been conducted on the imperative nature of education for postpartum mothers, with a focus on qualitative methodologies. In addition to conducting qualitative data collection, it is imperative to engage in rigorous quantitative studies. In order to elucidate the outcomes and discoveries. The research findings indicate a clear quantitative demand for educational interventions pertaining to maintenance. The mother demonstrates concern for various aspects of postnatal care, including mental well-being, breast health, and breastfeeding, as well as the management of postpartum wounds.

The significance of maternal mental health from pregnancy through the postpartum period lies in its potential influence on the well-being of children, partners, and the overall quality of life for mothers. The presence of depression in mothers during the postpartum period has the potential to impact the bonding process, interactions, and caregiving practices toward infants until the child's cognitive, emotional, and behavioral development reaches maturity (Patabendige et al., 2020). The postpartum period encompasses the early phase of motherhood, which is characterized by the temporary nature of this role and the significant responsibilities associated with caring for a young child. Hence, the occurrence of menstrual periods has been found to render women more susceptible to emotional stress and anxiety (Walker et al., 2020).

The primary source of educational information is health workers, comprising a significant proportion of specialist doctors ( $4.74 \pm 0.463$ ), followed by midwives ( $4.49 \pm 0.507$ ), and other health workers such as general practitioners and nurses ( $4.34 \pm 0.520$ ). In terms of respondent characteristics, it is noteworthy that a significant proportion of respondents reported giving birth in hospital settings. Consequently, the primary providers of healthcare services and information to these individuals are typically obstetricians. In addition, it is worth noting that approximately 17% of postpartum mothers opt to give birth at a midwife's practice. Consequently, a midwife serves as a viable alternative source of information in this context.

Online sources, such as YouTube and Google, are anticipated to be the primary means of disseminating information (mean = 4.50, SD = 0.558). Additionally, video platforms (mean = 4.34, SD = 0.600) and traditional media channels like radio and television (mean = 4.30, SD = 0.534) are also expected to play a significant role in information provision. Another study that aligns with this research is the investigation conducted by de Sousa et al. (2022), which explored the impact of educational videos on the retention of prenatal and postnatal knowledge among newborn infants and their families.

The findings of the research indicate that educational videos are a valuable tool for postpartum mothers, as they facilitate the acquisition of knowledge regarding the proper care of newborn infants. Furthermore, these videos assist in the provision of activity education and healthcare guidance by nurses. Additional research provides corroborating evidence for this claim.

The optimal period for dispensing information was found to be during pregnancy (mean = 4.44, standard deviation = 0.612), followed closely by the immediate postpartum period (mean = 4.40, standard deviation = 0.529) and the period after discharge from the healthcare facility (mean = 4.21, standard deviation = 0.589). This study aligns with the findings of Nazari et al., (2018) who discovered that the period of

pregnancy presents an optimal window for delivering educational interventions to postpartum mothers, facilitating their readiness to provide care for their newborn infants. This assertion is supported by the findings of a study conducted by McCarter-Spaulding & Spencer (2016), which indicate that providing educational guidelines regarding the care of newborns and mothers during the postpartum period does not yield significant effectiveness. An investigation into the efficacy of time management and educational content during the postpartum period is necessary. Postpartum mothers commonly express a diminished recollection of the educational content they received within their household, perceiving it as a mere "documented caregiver."

The anticipated approaches for conveying information include direct communication (mean = 4.63, standard deviation = 0.503), question and answer sessions (mean = 4.58, standard deviation = 0.521), and demonstrations (mean = 4.33, standard deviation = 0.718). Additional research conducted by Wagner and Washinton (2016), supports the findings of this study, indicating that first-time mothers who undergo the traditional method of teaching experience higher levels of satisfaction. The act of instructing reverts back to conventional methods, encompassing the dissemination of knowledge that was provided in a manner that was observed intently by the attending nurse. Additional research is in close proximity as well. The aforementioned assertion holds validity for the research conducted by Cheng et al., (2023), as evidenced by the outcomes of their study.

There is a notable impact of employing a significant teaching method to enhance postpartum health and body. The study involved three distinct phases, each focusing on different aspects of the postpartum period. These phases encompassed the time before childbirth, immediately after labor, and the two weeks following labor. The research methodology employed a combination of techniques, including surveys, interviews, direct observations, and demonstrations. These methods were utilized to gather information, pose relevant inquiries, obtain responses, provide guidance, and illustrate key concepts.

One notable aspect of this study is its utilization of a mixed-methods approach. At the outset, a qualitative research approach was employed to gain a comprehensive understanding of the educational requirements of postpartum mothers. This qualitative phase served as a foundation for the development of research instruments, which were subsequently utilized to conduct quantitative research. The construction of the instrument was informed by the identification of themes that arose during the analysis of qualitative data. The research sample size is substantial, consisting of 300 respondents, thereby ensuring representativeness in capturing the conditions of the research site.

One of the primary constraints of this study pertains to the sampling methodology employed. Obtaining samples at the Community Health Center posed challenges for researchers due to the prevailing trend among postpartum mothers to deliver their babies and undergo health check-ups at maternity hospitals and clinics. Meanwhile, the research permits were exclusively available at the North Kuta and South Kuta Community Health Centers. This phenomenon results in reduced variability in sample characteristics, specifically about the duration of delivery, thereby exerting an impact on educational requirements.

This study employs a descriptive research design to investigate the educational requirements of mothers during the postpartum period. Moreover, utilizing the data

derived from this study, it is possible to conduct further research employing experimental methodologies to examine materials, techniques, and platforms that are suitable for addressing the educational requirements of postpartum mothers residing in the province of Bali. Additional investigation can be conducted within diverse healthcare settings, including hospitals, clinics, autonomous midwifery practices, and community health centers.

## CONCLUSION

Postpartum mothers require tailored education for self-care and infant care. Success in education is contingent on appropriate materials, methods, and media, delivered at the right time and by qualified personnel. Further research, particularly experimental studies, can explore materials, methods, and media aligned with postpartum mothers' educational needs in Bali's province. The research scope can extend to various health services, including hospitals, clinics, independent midwives, and community health centers.

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## Systematic Review

# Standardized Nursing Language (SNL) Application in Diverse Nursing Practice and Documentation Settings

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### ABSTRACT

**Background:** Effective communication in healthcare is crucial, and Standardized Nursing Language (SNL) has emerged as a powerful tool to enhance nursing practice and documentation. However, disparities in SNL awareness and knowledge pose challenges to its effective implementation. This systematic review aims to synthesize research on SNL application in nursing practice across diverse settings, utilizing a comprehensive database search and predefined criteria for study selection.

**Methods:** Comprehensive searches were conducted across databases like PubMed, Scopus, ProQuest, and Web of Science. This systematic review adhered to the updated guidelines provided by PRISMA 2020. Three independent reviewers assessed study eligibility based on predefined criteria, resolving discrepancies through discussion. A narrative synthesis approach categorized and thematically analyzed the data, focusing on SNL's impact in diverse healthcare settings. Data was retrieved after the studies were subjected to quality assessment and risk of biases.

**Results:** The review included twelve studies spanning various healthcare systems and regions. While SNL demonstrated potential benefits, disparities in awareness, knowledge, and utilization were evident among participants. Challenges such as complex documentation processes and feasibility concerns were raised.

**Conclusion:** SNL plays a pivotal role in enhancing nursing practice, improving documentation, and facilitating effective communication. Addressing education gaps and providing ongoing training opportunities are essential to overcome implementation challenges. Collaboration among healthcare institutions, educators, and regulatory bodies is crucial to fully leveraging SNL's benefits for better patient care and healthcare outcomes.

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## INTRODUCTION

In contemporary healthcare landscapes, the application of Standardized Nursing Language (SNL) stands as a focal point in enhancing nursing practice and documentation across varied settings. As healthcare systems evolve and diversify, the efficacy and adaptability of SNL in catering to the nuances of diverse nursing practice settings warrant meticulous examination (Iyabode, 2017; Oreofe & Oyenike, 2018).

Effective healthcare communication stands as a linchpin in ensuring optimal patient care. Nurses, in their pivotal role as liaisons between patients and healthcare providers, wield the responsibility of translating clinical data into actionable insights. The precision in this process profoundly influences outcomes. Within this landscape, the emergence of Standardized Nursing Language (SNL) as a potent tool, particularly in care planning, warrants deeper investigation (Johnson et al., 2018).

The recognition and significance of SNL in nursing practice have gained traction. It offers standardized terms that facilitate consistent sharing of patient information across healthcare settings, thereby enhancing the clarity of documentation, clinical decision-making, quality assurance, and research efforts. In the contemporary healthcare milieu where electronic health records prevail, the systematic integration of nursing classification systems and standardized language holds pivotal importance (Johnson et al., 2018).

While Standardized Nursing Language (SNL) has shown promise in facilitating effective communication across diverse healthcare settings and improving patient care, its widespread adoption and practical application encounter multifaceted challenges. Researchers such as Thoroddsen et al., (2010) have highlighted SNL's ability to differentiate between specialties, illustrating its potential to transcend geographical limitations (Thoroddsen et al., 2010). Moreover, studies by Ojo & Olaogun (2022) demonstrate the positive impact of consistent training in standardized nursing languages, coupled with staff motivation and increased staffing, on documentation quality and patient care. However, despite these promising outcomes, SNL's integration into nursing practice faces intricate hurdles (Ojo & Olaogun, 2022).

Resistance to change, varying interpretations, and the necessity for ongoing education emerge as significant challenges that hinder SNL from becoming a pragmatic and invaluable tool for nurses. While SNL is upheld as the gold standard, its utilization remains suboptimal. Enebeli, Akpan-Idiok, et al., (2022) shed light on obstacles faced by nurses, such as difficulty in formulating precise nursing diagnoses, staffing shortages, time constraints, inadequate resources, and insufficient knowledge of NOC and NIC.

These challenges significantly impede the effective utilization of SNL (Enebeli, Akpan-Idiok, et al., 2022). It's important to appreciate the efforts showcased by Thoroddsen et al., (2010) and Ojo & Olaogun, (2022) in demonstrating SNL's potential and the positive outcomes associated with training initiatives. However, these studies also accentuate the complex nature of the challenges facing SNL's practical implementation in nursing practice (Ojo & Olaogun, 2022; Thoroddsen et al., 2010).

This systematic review endeavors to explore the application of SNL in nursing practice and documentation across diverse settings. It aims to synthesize existing research, unveiling the current state of adoption, impact, and challenges within healthcare. Our objective is to provide insights that foster effective SNL utilization, ultimately enhancing patient care and global collaboration. In the ensuing sections, we shall delve into the historical context, framework, methodologies, and outcomes

pertinent to SNL. This review seeks to contribute to the ongoing discourse on the integration of SNL in nursing practice.

## **MATERIALS AND METHOD**

### **Design**

This systematic review adhered to the updated guidelines provided by PRISMA 2020 when reporting its findings (Page et al., 2021).

### **Search Strategy**

We conducted a comprehensive search of electronic databases, including PubMed, Scopus, ProQuest, and Web of Science. No date restrictions were imposed on the search. The last search was performed on September 6, 2023. The search was guided by the following keywords and Medical Subject Heading (MeSH) terms: "standardized nursing language," "nursing documentation," "nursing diagnosis," "nursing interventions," "nursing outcomes," and related synonyms. We also manually searched the reference lists of selected studies to identify additional relevant sources.

### **Study Selection**

Three independent reviewers assessed the eligibility of studies based on predefined inclusion criteria: quantitative research studies, studies focusing on the application and impact of Standardized Nursing Language (SNL) in healthcare settings, studies addressing nursing documentation, diagnosis, interventions, and outcomes, and open-access studies. The exclusion criteria included review studies (literature reviews or systematic reviews) and studies that did not report on SNL. Any discrepancies in study selection among the reviewers were resolved through discussion, and a consensus was reached.

### **Data Extraction and Synthesis**

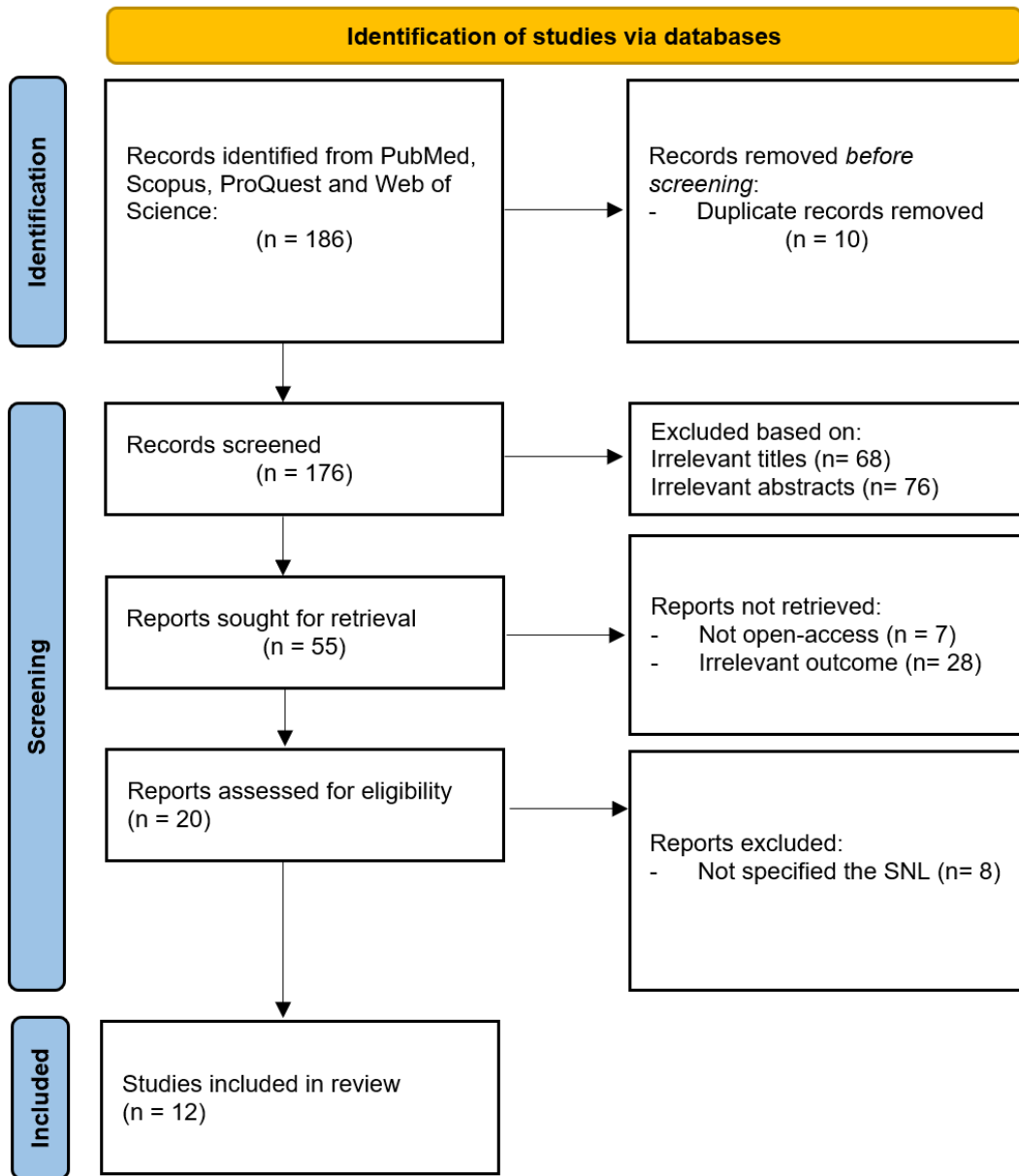
Data from the selected studies were systematically extracted, including study characteristics (e.g., author, publication year), study design, healthcare setting, and outcomes related to nursing documentation, diagnosis, interventions, and outcomes. A narrative synthesis approach was employed to summarize the findings of the included studies. The data were categorized and analyzed thematically, with a particular focus on the impact of SNL in diverse healthcare settings and its influence on nursing practice, documentation, diagnosis, interventions, and outcomes.

### **Study Quality Assessment**

The quality of the included articles was assessed using the STROBE statement for cross-sectional studies. Three reviewers independently evaluated each article and reached a consensus through discussion. The evaluation covered various aspects, including the article's sections, research framework, and suitability for inclusion based on STROBE criteria. A binary 'yes/no' approach was used for appraisal, and discussions on article significance and quality were frequent. The assessment tool had 22 questions addressing study components and potential biases. Table 3 summarizes the quality assessment data.

## RESULTS

### Search Results



**Figure 1.** Diagram Flow literature search

In Figure 1, there were initially 186 articles identified from the databases. Before the removal of duplicates, this number had been reduced to 176 articles, which were subjected to screening based on their titles and abstracts. Following this screening, 55 studies had been identified as potentially relevant after excluding those with irrelevant titles and abstracts. Subsequently, a more in-depth assessment of 20 studies was conducted to determine their eligibility, considering factors such as study methods, participants, accessibility, and the discussion within the studies. Ultimately, 12 studies had met the inclusion criteria and had been included in the review.

## **Study Characteristics**

A total of nine articles were included in this systematic review, each contributing valuable insights into the application and impact of Standardized Nursing Language (SNL) across diverse settings (Table 1). This review included different geographical regions and spanned healthcare systems at varying stages of development, including Nigeria, Indonesia, Italy, Brazil, Spain, and Korea.

## **Education and Training in SNL**

The studies conducted shed light on the awareness, knowledge, and utilization of Standardized Nursing Language (SNL) among participants. While certain studies revealed a notable degree of awareness, particularly among nursing students, disparities surfaced in participants' comprehension of SNL components. Moreover, inconsistencies emerged in SNL utilization, with some acknowledging regular use and others lacking consistent implementation in their practice (Adubi et al., 2018; Ojo et al., 2020; Olatubi et al., 2019).

The need for education and training to maximize the effectiveness of SNL among nurses in both Nigerian and Catalan studies became evident due to limited knowledge and familiarity with SNL components like the Nursing Outcomes Classification (NOC) and the Nursing Interventions Classification (NIC). Investing in seminars and training programs emerged as a viable solution to bridge knowledge gaps and bolster confidence in SNL usage (Adereti & Olaogun, 2019; Enebeli, Akpan-Idiok, et al., 2022; Rios Jimenez et al., 2020).

## **Application of SNL in Clinical Practice**

Standardized Nursing Language (SNL) has showcased extensive applicability across various clinical scenarios. It has effectively delineated the sociodemographic and clinical profiles of highly complex chronic patients (HCCPs), aiding in comprehensive health pattern assessments (Brito-Brito et al., 2022). In perioperative care, SNL highlighted disparities, emphasizing the crucial need for standardization in nursing practices (Widodo et al., 2020). Additionally, SNL has proven instrumental in describing Nursing Home (NH) residents' characteristics and identifying prevalent nursing diagnoses, outcomes, and interventions, offering invaluable insights into their care requirements (Shin et al., 2021).

Moreover, SNL's role in nursing diagnoses, planned outcomes, and interventions has been pivotal in ensuring uniformity and precision in patient care. It facilitated correlations within healthcare patterns, diagnoses, and interventions, improving the accuracy of nursing diagnoses and taxonomy analysis (Aleandri et al., 2022; Silva et al., 2022; Somantri et al., 2021).

## **Improving SNL Application in Clinical Practice**

Barriers hindering effective SNL utilization, such as staff shortages and resource limitations, call for clear usage policies and embracing electronic documentation like electronic health records (EHRs). A holistic approach, addressing educational gaps and providing support, is pivotal in overcoming these barriers and enhancing nursing practices (Adereti & Olaogun, 2019; Enebeli, Akpan-Idiok, et al., 2022; Rios Jimenez et al., 2020).

## **Implications and Synthesis**

The study's outcome suggests the utilization of various standardized nursing languages (SNL), including NANDA-I, NIC, NOC, NNN, SDKI, SLKI, and SIKI, in nursing practice across different healthcare settings and patient populations. Nurses applied these SNLs to formulate nursing diagnoses, outcomes, and interventions, although their usage varied among participants, leading to inconsistencies and discrepancies in application and accuracy. These standardized nursing languages played a pivotal role in documenting patient care, enhancing the quality of care, and facilitating effective communication among healthcare professionals. However, the study also highlights the need for ongoing education and training initiatives aimed at promoting the consistent and accurate implementation of SNLs in nursing practice.

Furthermore, the study encompasses several key aspects of nursing practice and knowledge related to SNL. It sheds light on the sociodemographic characteristics of participants, revealing a predominantly female nursing workforce with varying levels of education. Although there is a relatively high level of awareness of SNL, primarily acquired through educational experiences and workshops, formal theoretical teaching about SNL appears to be lacking for a significant portion of nurses. Knowledge levels regarding SNL exhibit disparities, with only a small percentage of participants possessing a comprehensive understanding.

While many nurses report using SNL in their healthcare facilities, the regular implementation of the nursing process appears to be infrequent, and there is no clear correlation between knowledge levels and consistent SNL utilization. Despite the variations in SNL awareness, knowledge, and utilization, the majority of nurses perceive SNL positively, acknowledging its potential to enhance nursing practice, improve care quality, and foster professional pride. However, some participants find SNL cumbersome, and a significant portion doubts its feasibility, even with adequate staffing resources.

## **DISCUSSION**

The findings from the various studies discussed in this synthesis point to the pivotal role of Standardized Nursing Language (SNL) in contemporary nursing practice. These studies provide valuable insights into the awareness, knowledge, utilization, and perceptions of SNL among healthcare professionals, nursing students, and across different healthcare settings and patient populations. Additionally, they shed light on the practical applications of SNL in clinical practice, highlighting its impact on healthcare documentation, nursing diagnoses, care planning, and overall patient care. In this discussion, we will delve into the implications of these findings, the challenges faced in implementing SNL, and the opportunities it presents for improving nursing practice and patient outcomes.

### **Enhancing Nursing Practice through Standardized Language**

One of the central themes that emerge from these studies is the potential of SNL to enhance nursing practice. The majority of participants in these studies expressed a positive outlook on SNL, recognizing its role in improving the quality of care provided to patients. They acknowledged SNL as a valuable tool for precise documentation, care planning, and effective communication among healthcare professionals.

This aligns with the broader healthcare industry's shift toward standardization and evidence-based practice. By using standardized language, nurses can ensure consistency



in documenting patient information, leading to improved care coordination and better patient outcomes. In a previous study, participants noted that care plans had only a moderate level of added value but were frequently used incorrectly.

While they had a reasonable grasp of traditional standardized nursing languages, they found them challenging to employ (81%) and ineffective in accurately representing nursing care delivery and its outcomes (78%). Regardless of their educational backgrounds and years of experience, participants felt that these language systems lacked clarity ( $P = .058$ ), ease of use ( $P = .240$ ), and practical applicability ( $P = .039$ ) in the context of actual nursing practice. Nurses emphasize the need for immediate changes, including the revision of language systems and the improvement of data, to have a positive impact on nursing care provision and the health outcomes of individuals receiving primary healthcare services (Rios Jimenez et al., 2020).

Acquiring accurate and comparable information from this system is of utmost importance for improving patient safety, the quality of healthcare, and evidence-based practices, as emphasized by Park and Lee's findings in 2015 (Park & Lee, 2015). Additionally, research conducted by Dai and their team in 2021 indicates that utilizing standardized nursing language based on NNN linkages when communicating with anxious patients in the emergency department (ED) could potentially alleviate their anxiety (Dai et al., 2021).

### **Awareness and Education Gaps**

However, the studies revealed disparities in SNL awareness and knowledge among participants, with some, especially nursing students, showing high awareness while others lacked formal education on SNL. This education gap can hinder consistent and accurate SNL implementation in nursing practice, highlighting the need for standardized education and training programs for nursing professionals. In a prior study, three hospitals showed moderate SNL usage rates (49.1%, 50.8%, and 46.7%) with varying documentation quality between 2015 and 2019. Respondents viewed nursing process booklets positively but faced challenges like motivation, staffing shortages, and SNL comprehension.

The specialty area had the highest predictive value ( $B = 0.790$ ) in association tests. Notably, significant differences existed in nursing documentation quality among the three hospitals, with mean values of  $1.3 \pm 0.5$ ,  $1.6 \pm 0.4$ , and  $1.5 \pm 0.4$ . In summary, utilization levels were moderate, and documentation quality fluctuated, necessitating standardized nursing language training to improve documentation in process booklets (Ojo & Olaogun, 2023). The study suggests that enhancing the use of SNLS can be achieved through increased seminars, the establishment of an SNL usage policy, and the adoption of electronic documentation (Enebeli, Akpan-Idiok, et al., 2022).

### **Challenges and Practical Considerations**

Some participants in these studies raised concerns about the potential complexity and practical challenges associated with SNL's implementation. These challenges included issues related to cumbersome documentation processes and doubts about SNL's feasibility even with adequate staffing resources. These concerns warrant attention from healthcare institutions and educators. It is essential to address these challenges by providing support, resources, and training to nursing professionals to help them overcome barriers to SNL adoption (Ojo & Olaogun, 2022, 2023).

## **Implications for Nursing Research and Practice**

The findings of these studies have several implications for nursing research and practice. Firstly, they highlight the need for ongoing research to explore the best practices for integrating SNL into nursing education and practice. Additionally, research can focus on developing user-friendly tools and technologies that streamline the documentation process, making it less burdensome for healthcare professionals. Secondly, nursing institutions and regulatory bodies should consider incorporating SNL education into nursing curricula and guidelines.

This can ensure that future generations of nurses are well-prepared to leverage SNL effectively in their practice. Moreover, healthcare organizations should invest in training and continuing education opportunities for their nursing staff, enabling them to keep pace with evolving SNL standards and practices. This investment can lead to improved patient care, reduced errors, and enhanced care coordination.

The limitation of this study was this systematic review wasn't registered with PROSPERO or other international databases.

## **CONCLUSION**

In conclusion, the studies discussed in this synthesis underscore the significance of Standardized Nursing Language (SNL) in contemporary nursing practice. SNL has the potential to revolutionize nursing documentation, care planning, and communication. While there are challenges and disparities in awareness and knowledge, there is a clear consensus on its positive impact.

To fully harness the benefits of SNL, healthcare institutions, educators, and regulatory bodies must collaborate to provide comprehensive education, training, and support to nursing professionals. By doing so, the nursing profession can continue to evolve, adapt, and thrive in an increasingly standardized and evidence-based healthcare environment. Ultimately, this will result in better patient care and improved healthcare outcomes.

Looking ahead, there are promising opportunities for further research and development in this domain. Collaborative endeavors among healthcare institutions, educators, and regulatory bodies are imperative to designing and implementing comprehensive educational frameworks. Such frameworks should aim at empowering nursing professionals with the requisite knowledge, skillsets, and support mechanisms essential for effective SNL utilization. Additionally, future research endeavors could delve deeper into assessing the long-term impact of enhanced SNL integration on patient outcomes and healthcare delivery models.

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## APPENDIX 1. Studies result in table

Table 2. Included study characteristics

Author, publication year	Study design, Country, Healthcare setting	Outcome
(Ojo et al., 2020)	Design: cross-sectional Country: Nigeria Healthcare setting: University	This study assessed awareness and perceptions of Standardized Nursing Language (SNL), NIC, NOC, and NANDA-I. Nursing students in Nigeria were well-informed about SNL. They perceived SNL as important for their education and practice and believed it should be integrated into their curriculum. Additionally, the study highlighted the significance of regulatory bodies and educational institutions in promoting SNL education in nursing programs.
(Olatubi et al., 2019)	Design: cross-sectional Country: Nigeria Healthcare setting: Hospital	Most of the participants (80.8%) had heard about SNL from school, seminars, or workshops, but only 60.0% knew the number of steps in the nursing process. Some nurses (39.2%) agreed that SNL cannot be practiced even with adequate staffing. SNL positively impacted nursing practice and care quality, but there were gaps in knowledge and regular use of SNL among the participants.
(Adubi et al., 2018)	Design: Retrospective record reviews Country: Nigeria Healthcare setting: University Hospital	1-5 years of experienced nurses total of 270 attended the Standardized Nursing Language Continuing Education Program (SNLCEP). These nurses were responsible for documenting in Nursing Process Books (NPBs) on various wards. There was a significant difference in the documentation of nursing care in different wards means the impact of SNLCEP was also different. The nurses had an improved quality of documentation of nursing care. The chi-square test result indicated there was no significant difference in documentation of nursing care among the wards.
(Brito-Brito et al., 2022)	Design: Observational, descriptive, cross-sectional, and epidemiological study Country: Spain Healthcare setting: Primary Care	Most of the participants were 65-79 years old (43.7%). About 77.7% of the participants were classified as independent (49%), frail (34.5%), and dependent (16.5%). Most participants (89.2%) were highly complex chronic patients. Common chronic health conditions included high blood pressure (87.2%), hyperlipidemia (80%), osteoarthritis (67.8%), and diabetes (56.1%). Significant associations were found between dysfunction in certain health patterns and age group, physical exercise habits, and chronic conditions like dementia. Several NIC interventions showed associations with older age groups, higher levels of dependency, and specific chronic health conditions like asthma and dementia.

<b>Author, publication year</b>	<b>Study design, Country, Healthcare setting</b>	<b>Outcome</b>
(Widodo et al., 2020)	Design: Descriptive study Country: Indonesia Healthcare setting: Hospital	The most frequently established nursing diagnosis in perioperative patients was anxiety (46.23%). According to the SDKI, most frequent diagnosis were 27.36% of cases. The most frequent outcome was level of infection (27.36%), determined with SLKI. But, all specified nursing interventions determined in the study were found not to be in accordance with the SIKI. Most of the intervention, implementation, and evaluation of nursing care were following the standards.
(Silva et al., 2022)	Design: Mixed-method study Country: Brazil Healthcare setting: Hospital	The primary surgical indication of patients was osteoarthritis (86%). Acute pain was the most prevalent nursing diagnosis (96%), followed by Risk for falls (62%). Fall prevention intervention (33.3%) was the most prescribed. There was a significant improvement in all nursing outcome scores from the first to fourth day of follow-up.
(Aleandri et al., 2022)	Design: Descriptive study design Country: Italy Healthcare setting: Community Health Centers	Nursing diagnoses were correctly identified in care plans based on nursing assessments with an accuracy rate of 83.7%. The study further analyzed the "needs" section using the NANDA-I taxonomy to link diagnoses to specific needs. There were incomplete nursing care plans in the software. Approximately 13.4% of the plans lacked either outcomes or interventions. These findings provide insights into the nursing process and areas where improvements in care planning and documentation may be needed.
(Shin et al., 2021)	Design: Retrospective descriptive study Country: Korea Healthcare setting: Nursing Home Residents	The study included 57 residents from 21 NHs. The most frequent nursing diagnosis in NHs was "risk for falls," (85.9%). The most frequently applied NOC outcomes were "vital signs" and the most frequently applied NIC interventions included "medication management." The study analyzed linkages between nursing diagnoses, outcomes, and interventions (NNN linkages).
(Somantri et al., 2021)	Design: cross-sectional research Country: Indonesia Healthcare setting: Hospital	Most nurses (56.06%) obtained knowledge about nursing diagnosis formulation from their teachers. Half of the respondents (50%) referred to textbooks for formulating nursing diagnoses and 48.49% did not use standardized nursing diagnoses. Nurses with undergraduate education had a higher rate of correct diagnoses (50%) compared to those with diploma education (21.4%). Nurse practitioners' level 1 had the highest percentage (50%) of correctly formulated nursing diagnoses compared to

Author, publication year	Study design, Country, Healthcare setting	Outcome
		other career levels.
(Enebeli, Akpan-Idiok, et al., 2022)	Design: cross-sectional research Country: Nigeria Healthcare setting: Tertiary health facility	The primary finding of the research indicates that although nurses acknowledge the benefits of employing SNLs, they face obstacles that impede their effective utilization. These challenges encompass a shortage of staff, time constraints, inadequate resources, and a lack of familiarity with NOC and NIC. As a result, the application of SNLs among nurses is suboptimal.
(Rios Jimenez et al., 2020)	Design: Multicenter, observational, cross-sectional Country: Spain Healthcare setting: Primary healthcare centers	This study revolved Primary Healthcare's words regarding the utilization and effectiveness of standardized nursing care plans and traditional nursing language systems. Nurses concerns about the frequent misuse of care plans and faced challenges applying traditional standardized nursing languages in practical situations. Despite possessing reasonable knowledge, they found these language systems inadequate for accurately representing nursing care and outcomes in individuals receiving Primary Healthcare services in Catalonia
(Adereti & Olaogun, 2019)	Design: Quasi-experimental Country: Nigeria Healthcare setting: Hospital	The study involved 32 nurses, divided into two wards. Regarding computer familiarity, 75% of electronic ward nurses and 62.5% of paper ward nurses reported being familiar with computers. The study evaluated nurses' documentation quality across various phases of the nursing process and found significant improvements after educational intervention in both wards.

## Appendix 2. Critical Appraisal

### JBI CRITICAL APPRAISAL CHECKLIST FOR ANALYTICAL CROSS-SECTIONAL STUDIES

No	Question	Olatubi et al. (2019)	Ojo et al. (2020)	Britto-Britto et al. (2022)	Widodo et al. (2020)	Aleandri et al. (2022)	Somantri et al. (2021)	Enebeli et al. (2022)	Jimenez et al. (2020)
1	Were the criteria for inclusion in the sample clearly defined?	Y	Y	Y	Y	Y	Y	Y	Y
2	Were the study subjects and the setting described in	Y	Y	Y	Y	Y	Y	Y	Y



No	Question	Olatubi et al. (2019)	Ojo et al. (2020)	Britto-Britto et al. (2022)	Widodo et al. (2020)	Aleandri et al. (2022)	Somantri et al. (2021)	Enebeli et al. (2022)	Jimenez et al. (2020)
	detail?								
3	Was the exposure measured in a valid and reliable way?	Y	Y	Y	Y	Y	Y	Y	Y
4	Were objective, standard criteria used for measurement of the condition?	Y	Y	Y	Y	Y	Y	Y	Y
5	Were confounding factors identified?	Y	N/A	Y	Y	U	N	Y	Y
6	Were strategies to deal with confounding factors stated?	Y	Y	Y	Y	Y	Y	Y	Y
7	Were the outcomes measured in a valid and reliable way?	Y	Y	Y	Y	Y	Y	Y	Y
8	Was appropriate statistical analysis used?	Y	Y	Y	Y	Y	Y	Y	Y

Note: Y = yes; N= no; U= unclear; N/A= not applicable

#### JBI CRITICAL APPRAISAL CHECKLIST FOR QUASI-EXPERIMENTAL STUDIES

No	Question	Adubi et al. (2018)	Silva et al. (2022)	Shin et al. (2021)	Adereti et al. (2019)
1	Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	Y	Y	Y	Y
2	Were the participants included in any comparisons similar?	N/A	N/A	N/A	Y
3	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of	Y	Y	Y	Y

No	Question	Adubi et al. (2018)	Silva et al. (2022)	Shin et al. (2021)	Adereti et al. (2019)
	interest?				
4	Was there a control group?	N	N	N	Y
5	Were there multiple measurements of the outcome both pre and post the intervention/exposure?	Y	N	Y	Y
6	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Y	Y	Y	Y
7	Were the outcomes of participants included in any comparisons measured in the same way?	Y	Y	Y	Y
8	Were outcomes measured in a reliable way?	Y	Y	Y	Y
9	Was appropriate statistical analysis used?	Y	Y	Y	Y

Note: Y = yes; N= no; U= unclear; N/A= not applicable

## Original Research

# Cadre Knowledge And Self-Efficacy Following Care For Child Development Post Intervention: A Four-Year Prospective Follow-Up Study

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**Background:** Stunting is a significant malnutrition problem in Indonesia, and community health cadres play a vital role in addressing it through programs like Care for Child Development (CCD) training. This study aimed to delineate the knowledge and self-efficacy of cadres who participated in CCD training in Yogyakarta in 2018, comparing their status in 2022.

**Methods:** In October 2022, a quantitative cross-sectional approach was utilized to examine the knowledge and self-efficacy of 56 cadres who had undergone CCD training in 2018, organized by the same authors and documented in a prior publication, with participants selected through total sampling. Three instruments were utilized, including a participant demographic survey, the CKCDI, and the GSES. The paired *t*-test was employed to analyze the data.

**Results:** The study's results reveal a significant difference ( $p=0.002$ ) in the mean knowledge scores of cadres following their participation in the Care For Child Development (CCD) training program in 2018 and four years later. The mean score was 13.39 in 2018, decreased to 11.9 in 2022. Likewise, the self-efficacy component among cadres exhibited a reduction, with mean scores of 30.93 in 2018 and 29.4 in 2022. However, it is important to note that there is no statistically significant difference in self-efficacy ( $p=0.106$ ). The decline in average knowledge scores over the four-year period may be attributed to potential knowledge decay.

**Conclusion:** This study underscores the significance of sustained training and support for community health workers, emphasizing the need for flexible approaches to maintain their knowledge and self-efficacy over time.

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## INTRODUCTION

Stunting is the most prevalent malnutrition issue in Indonesia when compared to other concerns. It refers to a form of malnutrition observed in children below the age of five who exhibit proportions of weight and height that are lower than expected (Kementerian Kesehatan Republik Indonesia, 2022). 250 million children under the age of five in low- and middle-income countries face heightened risks of unfavorable developmental outcomes (Lu et al., 2016). Notably, Indonesia is ranked fifth among nations with the highest prevalence of stunted children. In Indonesia, nearly 37% of children under 5 years old experience suboptimal developmental outcomes, with approximately 18% suffering from severe stunting (Satriawan, 2018).

Several factors contribute to this condition, including poverty, malnutrition, environments lacking stimulation, and deficiencies in essential micronutrients. Children affected by stunting encounter growth delays that impede their capacity for critical thinking, adaptability, information assimilation, and learning (Lamers et al., 2011; UNICEF, 2017). The obstacles to cognitive development experienced by stunted children exert influence not only on their present cognitive levels but also on their future productivity potential (Ministry of Health Indonesia, 2018).

Expediting the decrease of stunting holds a prominent position among the nation's priorities. This aligns with the directives of Presidential Regulation Number 72 of 2021, which outlines the National Action Plan for Accelerating the Reduction of Stunting (RAN PASTI). This plan encompasses the execution of support for families vulnerable to stunting, aid for potential brides/spouses of reproductive age (PUS), and the monitoring of families at risk of stunting. In this context, the pivotal role of cadres as the Family Assistance Team (TPK) emerges as an urgent necessity (Pemerintah Indonesia, 2021).

Health cadres are community members who voluntarily extend assistance and outreach to enhance community health (Pradana et al., 2020). They play a pivotal role in maternal and child health programs due to their close community ties, facilitating effective health program delivery (Andriani et al., 2017). Information conveyed by health cadres is readily accepted and trusted by the community, bolstering their impact (Pradana et al., 2020). Effective promotive and preventive training for cadres hinges on comprehensive academic and technical knowledge. Notably, Care For Child Development (CCD) training is a potent program for cadres, especially in stunting prevention (Akhmadi et al., 2021).

CCD, a UNICEF and WHO initiative, equips cadres with skills to address child growth and development issues through family-focused methods involving active play and communication. This training enhances parent-child interaction quality, fostering responsive parenting and optimal child growth. Proven effective, CCD training positively influences knowledge, attitudes, and self-efficacy of health workers, parents, and communities (Ahun et al., 2023; Unicef, 2013).

According to previous research the implementation of CCD training led to a noteworthy upsurge in cadre knowledge and effectiveness (Akhmadi et al., 2021). This aligns with previous research which indicated a substantial boost in self-efficacy among cadres post CCD training, observed in both intervention and control groups (Yanuardani & Haryanti, 2016). Similarly, in the knowledge domain, the CCD training intervention group exhibited notably greater knowledge enhancement compared to the control group (Akhmadi et al., 2021). Suyatno & Kartosuyo's study revealed that the training and guidance provided to cadres effectively increased their knowledge and performance scores (Suyatno & Kartasurya, 2019).

While previous research has investigated cadre knowledge and self-efficacy following CCD training, especially in Yogyakarta, external factors may have influenced these aspects. Therefore, this prospective follow-up investigation aimed to examine the knowledge and self-efficacy of cadres who participated in CCD training in Yogyakarta in 2018, comparing their status in 2022.

## **MATERIALS AND METHOD**

### **Study Design**

In October 2022, a follow-up study was conducted using a quantitative cross-sectional approach to assess the knowledge and self-efficacy of cadres who underwent CCD training in Yogyakarta in 2018, comparing their status in 2022.

### **Sample and Settings**

The sample consisted of 56 cadres who had previously undergone CCD training in 2018, organized by the same authors and documented in a prior publication (Akhmadi et al., 2021). Data collection took place within the operational region of the Kalibawang Health Center in Kulon Progo Regency, Yogyakarta, specifically covering four hamlets—Banjar Arum, Banjar Asri, Banjar Harjo, and Banjar Oyo. Participants were chosen through total sampling, and as such, inclusion criteria and sample size calculation were not conducted in this study.

### **Instruments**

The instruments utilized in this research was identical to the one employed in our earlier study in 2018. Furthermore, the data utilized in this study was derived from a previous investigation, and no permission was necessary as the data belonged to the authors themselves. This study employed three instruments, including a demographic questionnaire for participants, the Caregiver Knowledge of Child Development Inventory (CKCDI), and the General Self-Efficacy Scale (GSES). Information about participants' basic characteristics such as age, occupation, education, and duration as cadres was gathered. The CKCDI assessed cadre knowledge related to child development, providing child stimulation, and educating mothers about appropriate mother-child interactions based on developmental stages. It consisted of 20 questions, with the Indonesian version validated through translation and back-translation. The knowledge instrument demonstrated good reliability (Cronbach's alpha = 0.820). Scores ranged from 0 to 40, with higher scores reflecting greater knowledge (Akhmadi et al., 2021). Furthermore, cadre efficacy pertained to their confidence in educating primary caregivers about stimulating child development. Cadre efficacy was measured using the Indonesian version of the General Self-Efficacy Scale (GSES), developed by Schwarzer and Jerusalem in 1995. The GSES employs a Likert scale and achieved an internal validity test result of 0.725. Total scores ranged from 10 to 40, with higher scores indicating heightened efficacy. The Indonesian language version of GSES is accessible at the link: <http://userpage.fu-berlin.de/%7Ehealth/indonese.htm>.

### **Data Collection**

The data collection was conducted online by distributing a Google Forms link that had been created and contained various research instruments to be assessed. This activity took place after obtaining ethical clearance. Prior to data collection, the researcher conducted a preliminary study to determine the number of cadres who had received CCD

training and were still active in the working area of Kalibawang Health Center. Subsequently, after obtaining data on cadres as potential respondents, the researcher sought research permission from Kalibawang Health Center to secure approval study.

### Ethical Consideration

Prior to the study, participants provided their informed consent by signing a form provided by the research team, which also included an explanation of the research's purpose and procedures. Ethical clearance, numbered KE/FK/1226/2022, was obtained before commencing the study. The research team ensured the anonymity of participants by avoiding the use of personal identifiers in the data collection process. Participants were assured of the option to withdraw from the study at any point without facing consequences. Additionally, data privacy was strictly maintained, with the collected information stored securely and accessible only to the authorized research team to uphold confidentiality.

### Statistical Analysis

The methodology employed in this study encompasses both univariate and bivariate analyses. Univariate analysis findings are presented in a table displaying frequencies, percentages, and means. Bivariate analysis involved the use of a paired t-test to compare the current cadre knowledge and self-efficacy with those from four years ago following their participation in the 2018 Care for Child Development program.

## RESULTS

### Respondents characteristics

The findings of the descriptive analysis of respondent characteristics in Table 1 reveal that the respondents are primarily dominated by cadres in the late adult and early elderly age category, amounting to 22 individuals (39.3%). The majority of these cadres are homemakers, totaling 49 individuals (87.5%), and the most prevalent educational level is high school, with 36 individuals (64.3%). Regarding work experience, a significant portion of cadres, 29 individuals (51.8%), fall into the category of working for more than 12 years.

Table 1. Respondent Characteristics (n=56)

	<b>Variable</b>	<b>f</b>	<b>%</b>
<b>Age</b>	Early Adulthood (26-35)	6	10.7
	Late Adulthood (36-45)	22	39.3
	Early Elderly (46-55)	22	39.3
	Late Elderly (56-65)	6	10.7
<b>Occupation</b>	Housewife	49	87.5
	Teacher	1	1.8
	Farmer	4	7.1
	Entrepreneur	1	1.8
	Self-employee	1	1.8
<b>Educational background</b>	Elementary	4	7.1
	Junior high school	14	25.0
	Senior high school	36	64.3
	College	2	3.6
<b>Duration as cadres</b>	<12 years	27	48.2
	>12 Tahun	29	51.8

## Knowledge

The analysis of Table 2 above reveals that the average knowledge level of community health workers regarding family support is 11.94. This is further elaborated by the fact that 32 individuals (57.1%) possess limited knowledge, which is higher when compared to the 24 respondents (42.9%) who have a good level of knowledge.

Table 2. Cadres Knowledge Post-CCD Training in 2022 (n=56)

Variable	Category	f	%
Knowledge	Low	32	57.1
	High	24	42.9

Based on Table 3, three questionnaire items have incorrect responses. Specifically, item number 14 has an average score of 71.4, item number 17 has an average score of 82.1, and item number 20 has an average score of 87.5. Furthermore, there are three statement items with the highest correct responses. These are item number 1 with an average score of 98.2, item number 6 with an average score of 94.6, and item number 11 with an average score of 96.4.

Table 3. Analysis of Percentage of Responses to Items in the Caregiver Knowledge Child Development Inventory (CKCDI) Questionnaire in 2022 (n=56)

Item	Question	True (%)	False (%)
1	A child's brain begins to develop even while in the womb.	98.2	1.2
2	Newborns cannot see when they are born.	60.7	39.3
3	A baby's eyes start to track moving objects or toys after 3 months.	46.4	53.6
4	Babies begin to respond to people talking to them with sounds after 3 months.	41.1	58.9
5	Babies can smile at other people's faces before they turn 2 months old.	80.4	19.6
6	Between 9-14 months, children can start saying at least one meaningful word.	94.6	5.4
7	Children can engage in imaginative play, like feeding dolls or pretending to drive toy cars, after they turn 2 years old.	44.6	55.4
8	Around 4-5 months, babies can reach for and grab toys in front of them.	91.1	8.9
9	Babies can pick up small objects like raisins or nuts with their fingertips before they turn 7 months old.	30.4	69.6
10	Children can walk independently with good balance at 18 months old.	32.1	67.9
11	Speaking to a child while they are still in the womb is a good time to start.	96.4	3.6
12	Providing colorful objects before a child is 5 months old is a good way to help them practice reaching and grasping.	92.9	7.1
13	Teaching counting to a child is best done after they turn 2 years old.	55.4	49.6

14	Teaching colors to a child is best done before they turn 1 year old.	28.5	71.4
15	Introducing a spoon or fork for a child to start feeding themselves is recommended when they are over 2 years old.	69.6	30.4
16	Giving a child paper and colored pencils to draw and color with is a good idea starting at 1 year old.	69.6	20.4
17	Babies can sit with assistance at 3 months old.	17.9	82.1
18	When a child is 4 months old, mothers can provide clean and safe objects or toys that babies can play with in their mouths.	83.9	16.1
19	Mothers can begin reading books to their child when they are 4-6 months old.	48.2	51.8
20	Mothers can provide clean and safe household items for their child to play with when they are over 1 year old.	12.5	87.5

### Self-efficacy

Based on Table 4, the analysis results indicate that 58.93% of the surveyed community health workers exhibit a strong sense of self-efficacy, while 41.07% still have a lower level of self-efficacy. The determination of self-efficacy levels is based on the average score obtained by respondents, which is 29.41, and the median score of 30. Therefore, it can be concluded that scores  $\geq 30$  fall into the good category, whereas scores  $< 30$  are categorized as lower.

Table 4. Cadres Self-Efficacy Post-CCD Training in 2022 (n=56)

Variabel	Category	f	%	Mean
Self-efficacy	Low	23	41.1	29.41
	High	33	58.9	

According to Table 5, it is showed that within the domain of self-efficacy, three dimensions should be considered. In 2018, the "magnitude" dimension had a mean score of 3.12. The "strength" dimension had a mean score of 2.92, and the "generality" dimension had a mean score of 3.16. Additionally, in 2022, the "magnitude" dimension had a mean score of 3.0. The "strength" dimension had a mean score of 2.82, and the "generality" dimension had a mean score of 2.93.

Table 5. Mean Scores for Each Dimension of Community Health Worker Self-Efficacy

Self-efficacy dimension	Item number	Mean	
		2018	2022
Magnitude	1, 6, 7, 8, 9	3.12	3.0
Strength	4, 5, 10	2.92	2.82
Generality	2, 3	3.16	2.93

The analysis results from the table 6 indicate that the average scores for the knowledge aspect of community health workers have decreased from 13.39 in 2018 to 11.9 in 2022, resulting in a mean difference of 1.571. Similarly, the self-efficacy aspect of community health workers has shown a decline, with average scores of 30.93 in 2018



and 29.4 in 2022, yielding a mean difference of 0.982.

Table 6. Changes in the Knowledge and Self-Efficacy of Cadres in 2018 and 2022

Variable	Mean		Mean difference	P-value
	2018	2022		
Knowledge	13,39	11,94	1,571	0.002
Self-efficacy	30,93	29,41	0,982	0.106

## DISCUSSION

The study investigated the knowledge and self-efficacy of cadres in 2018 and 2022, with a focus on participants aged 30 to 65. Cross-tabulation results indicated that early elderly workers generally had lower levels of knowledge and self-efficacy, whereas those in the late adult age group demonstrated higher levels. Homemakers among the cadres tended to exhibit good knowledge and self-efficacy. Additionally, there was a noted correlation between higher education and improved knowledge.

Furthermore, the study utilized the Caregiver Knowledge Child Development Inventory (CKCDI) questionnaire, comparing outcomes between 2018 and 2022. The mean knowledge score decreased from 13.39 in 2018 to 11.9 in 2022, suggesting a significant decline possibly influenced by disruptions caused by the pandemic. Knowledge plays a crucial role in shaping individual actions (overt behavior), and the study findings indicate that the average knowledge level of cadres is classified as good. A previous study highlighted that the substantial time gap between evaluations led to a lack of updates or improvements to support program activities (Idami et al., 2022; Lahmadi et al., 2021; Suryaningsih et al., 2023).

Significantly, certain aspects, including the suitable age for introducing safe household items (87.5% unaware), aiding a child to sit at three months (82.1% unaware), and initiating color exposure for children (71.4% unaware), highlighted gaps in awareness. It's noteworthy that children under 1 year old typically perceive colors less vividly than adults, suggesting the introduction of primary colors (red, yellow, or blue) can commence around the age of 2. Furthermore, the majority of children can recognize at least 2 colors by the age of 3 (Overkott et al., 2022; Speed et al., 2021; Sprenger & Benz, 2020).

Concerning self-efficacy, the average score declined from 30.93 in 2018 to 29.4 in 2022. An examination of self-efficacy dimensions showed that while community health workers exhibited strength in addressing challenging problems, beliefs in task completion (strength dimension) had the lowest average score. The generality dimension, associated with confidence in various situations, had a moderate average score. This dimension encompasses beliefs in the breadth of the behavioral domain and whether there are limitations to one's confidence in abilities in specific situations or activities (Dalimunthe & Ramadini, 2019; Darwenty et al., 2023; Hanifah, n.d.).

The descriptive analysis compares the knowledge levels of community health workers using 2018 secondary data and 2022 primary data. The findings reveal a decrease in average knowledge scores four years after the Care For Child Development (CCD) training program, declining from 13.39 in 2018 to 11.9 in 2022. This decrease is attributed to disruptions caused by the pandemic, affecting training and knowledge enhancement, and subsequently impacting the delivery of posyandu health services. This aligns with previous studies that emphasize the influence of training on the knowledge of health workers. Knowledge plays a crucial role in shaping behavior and motivating community health

workers to take proactive measures (Afzal et al., 2021; Ballard et al., 2020; Hesaraki et al., 2021).

Likewise, the self-efficacy levels of community health workers have decreased. The average self-efficacy score was 30.93 in 2018, and it dropped to 29.4 in 2022. Four years post the CCD training program, a noticeable impact on the self-efficacy levels of these workers is evident. This aligns with a prior study asserting that the pandemic disrupted training activities, resulting in the lack of essential training programs for community cadres (Bhaumik et al., 2020; Gilmore et al., 2020; Kamacooko et al., 2021).

### **Limitation**

This study possesses certain limitation. The use of a cross-sectional methodology offers a momentary view of knowledge and self-efficacy at distinct time points, possibly overlooking dynamic shifts or patterns. While the sample size is representative, it might constrain the applicability of the results to wider populations. Additionally, the study did not delve into the intricacies of individual experiences during the CCD training program, which could have yielded more comprehensive insights into the factors impacting knowledge and self-efficacy.

### **Implication and Recommendation**

This study emphasizes the need for tailored and consistent training for community health workers, recognizing the impact of external disruptions, like pandemics, on training effectiveness. Program planners and policymakers should prioritize strategies addressing knowledge decay and enhancing self-efficacy over time to ensure the continued delivery of effective health services at the grassroots level. Customizing training programs to address the specific needs and challenges of community health workers, considering their diverse backgrounds and responsibilities, is also crucial.

For future research, it is recommended to explore the factors causing the decline in knowledge and self-efficacy among community health workers, considering contextual influences and regional variations. Investigating the effectiveness of alternative training methods to mitigate disruptions, like pandemics, would offer valuable insights. Additionally, examining the sustained long-term effects of continuous training and support on the knowledge and self-efficacy of community health workers could provide a comprehensive understanding of their professional development.

### **CONCLUSION**

In conclusion, this study illuminates the knowledge and self-efficacy of community health workers, both before and after CCD training, with a four-year gap between assessments. The research highlights a significant decline in average knowledge scores between 2018 and 2022, attributed to disruptions impacting training and knowledge enhancement. This decrease in knowledge carries critical implications as it strongly influences behavior and service effectiveness, notably in posyandu centers. Additionally, there is a corresponding drop in average self-efficacy scores during the same period, influenced by the prolonged training gap. Self-efficacy plays a pivotal role in motivating health workers, and its decline can hinder service delivery.

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## Original Research

### Effect Light-Intensity on Sleep Quality in Elderly

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#### ABSTRACT

**Background:** Bedroom lighting is accused of being one of the factors causing changes in the quality of sleep in the elderly. Modifying the power of room lighting is an alternative to improving the sleep quality of the elderly. The aim of the study is to determine the effect of lighting intensity on the sleep quality of elderly.

**Methods:** A quantitative study with a quasi-experimental control group design. Amount of sample is 40 responden and chosen used random sampling. Quality of sleep measure by Pittsburgh Sleep Quality Index (PSQI) and light-intensity measure used a luxmeter. the intervention group received lights with an intensity of 5, 10, 15, 20 watts, where the respondents were treated every day for 4 days with these light intensities. The Shapiro-Wilk test was used to test the normality of the data, while paired T test used to analyze the conditions before and after in the control and treatment groups. Independent sample t-test used to compare the sleep quality of the control and treatment groups.

**Results:** There was no difference in sleep quality in the control group (0.15) between before and after the study, but there was a difference in sleep quality in the intervention group (0.00). There were differences in sleep quality between the control and treatment groups after the intervention was given (0.01).

**Conclusion:** The intensity of the light has an effect on the sleep quality of the elderly, where the lower the intensity of the light, the better the quality of sleep. Elderly should sleep on level lighting intensity less than 5 watt.

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## INTRODUCTION

In elderly patients, if they have poor sleep quality, they are at high risk of having a stroke. The best way to prevent stroke is to improve sleep quality. The number of hours of sleep affects the level of risk of stroke (Song et al., 2023) Physical activity affects mental health which will also affect the quality of sleep and quality of life. Elderly who have good physical activity habits so that quality of life, quality of sleep increases (Yuan et al., 2020a).

The average human spends about 6-8 hours sleeping. Sleep is an important process in recovering from physical and psychological fatigue in humans (Yan et al., 2022). Factors that affect the quality of sleep in the elderly, namely were reduced at higher air temperature, relative humidity and CO<sub>2</sub> concentration (Yan et al., 2022).

Many studies regarding efforts to improve sleep quality of elderly both pharmacological and non-pharmacological. Her & Cho (2021) reported that aromatherapy can improve sleep quality and reduce anxiety, depression, stress, pain, and fatigue in adults and elderly people (Shree Ganesh, Subramanya, Rao M, & Udupa, 2021). also reported that yoga as a daily practice regimen to improve sleep quality in elderly population.

Increasing age as an elderly person will experience various kinds of changes in the body such as physiological changes, functional changes, cognitive changes, and psychosocial changes. Data from WHO, elderly people over 60 years of age in the world are expected to approximately double from 12% to 22%. In Indonesia in 2021 the largest number of elderly people will be DIY with a percentage of 15.52%, Central Java 14.17%. Surakarta has 12.16% of the total population with a life expectancy of 77.22 years. Elderly people experience physiological changes including dry skin, thinning hair, decreased hearing, decreased blood pressure and heart rate. One of the physiological changes that often occurs is the quality of sleep in the elderly. Complaints of insomnia in the elderly are often related to problems with the quality of the elderly's sleep.

The prevalence of elderly people with sleep disorders in 2020 reached around 67%. Meanwhile, in Indonesia, sleep disorders attack around 50% of elderly people aged >60 years. Environmental factors are one of the obstacles to the quality of the elderly's sleep, which usually occurs in elderly people's homes that are less clean, inappropriate lighting conditions such as the level of strength of the bedroom lighting used, in the elderly community many people do not know the correct use of resting light. . Lighting is an important factor in determining sleep quality. Lighting has four standards and their units which include: the first is light flow (luminous flux), the second is light intensity (luminous intensity), the third is illuminance, and the fourth is luminance. Measuring light intensity uses a luxmeter as a measuring tool in a room for the light coming on an object. The daily lighting requirements for room lighting vary, one of which is in the bedroom, namely 150 lux (small room) with different types of lamps and wattages between 5-20 watts.

A limited number of studies have investigated the effects of the lighting-intensity on the sleep quality of elderly subjects. Aim of study is to determine the effect of lamp light intensity on sleep quality in the elderly

## **MATERIALS AND METHOD**

The quasi-experiment prepost test design with a control group that does not function fully in controlling external variables that influence the research. Research with a nonequivalent control group design is an approach with a pre-post test selected based on inclusion and exclusion criteria which will then be compared between the intervention and control groups.

The population in this study were all elderly people in the Kentingan Jebres Surakarta area located in RW 36 aged 60-90 years, totaling 56 people. Sample criteria include Inclusion Criteria are research subjects who represent the research sample that meets the requirements as a sample. The inclusion criteria in this study were: 1) Elderly people who were willing to be respondents, 2) Elderly people aged  $\geq 60$  years, 3) Elderly

people who had lights in their bedroom, 4) Elderly people who had their own bedroom. Exclusion criteria are research subjects who do not represent the sample because they do not meet the requirements as a sample such as ethical obstacles, refusing to be a respondent or circumstances that make it impossible. The exclusion criteria in this study were: 1) Elderly people who have dementia, 2) Elderly people who are not willing to be respondents, 3) Elderly people who take sleeping pills, 4) Elderly people who sleep with their families. Meanwhile, sampling in this study used the Solvin formula.

## RESULTS

The results of the normality and homogeneity test analysis showed that the data were normally distributed and paired group tests were carried out, namely the paired-test and unpaired groups, namely the independent t-test. The results of the analysis of the paired T-test consisted of 20 respondents, the mean of the intervention group before and after at 5 watt intensity was 7.25 and 5.35 with standard deviation 3.416 and 2.300 and p value 0.01, at 10 watt intensity 7.25 and 8.20 with standard deviation 3.416 and 3.105 and p value 0.25, at 15 watt intensity 7.25, and 9.40 with standard deviation 3,416 and 2,761 and p value 0.00 and at 20 watt intensity 7.25 and 10.10 with standard deviation 3,416 and 2,447 and p value 0.00 so it can be concluded that there is an influence on improving the quality of sleep in the elderly using lamp light intensity of 5, 15 and 10 watts.

Based on the low average sleep quality of the elderly, there is a light intensity of 5 watts which is reinforced by a short distance between the data distribution (standard deviation) and the average (mean) compared to the standard deviation and average of other light intensities. The results of the analysis of the paired T-test consisted of 20 respondents, the mean of the control group before and after the intensity of post test 1, namely 8.40 and 8.45 with a standard deviation of 2.683 and 3.170 and a p value of 0.83, for the intensity of post test 2, namely 8.40 and 9.20 with a standard deviation of 2.683 and 3.792 and p value 0.09, intensity of post test 3 namely 8.40 and 9.40 with standard deviation 2.683 and 3.362 and p value 0.01, intensity of post test 4 namely 8.40 and 8.90 with standard deviation 2.683 and 3.161 and p value 0.13 so it can be concluded that there is an influence on post test intensity 3 which uses the light intensity of the lamp that is usually used. This cannot be used as a benchmark because the average sleep quality for each elderly person is not much different due to the use of the same light between pre and post in the control group.

The results of the analysis of the Independent t-test consisted of 40 respondents, the mean of intervention and control group 1 was 5.35 and 8.45 with a standard deviation of 2.300 and 3.170 and a p value of 0.00, intervention and control group 2 were 8.20 and 9.20 with a standard deviation of 3.105 and 3.792 and a p value 0.37, intervention and control group 3, namely 9.40 and 9.40 with a standard deviation of 3.362 and 3.362 and p value 1.00, intervention and control group 4, namely 10.10 and 8.90 with a standard deviation of 2.447 and 3.161 and p value 0.18. It can be concluded that there is a difference in the intervention group and control. The results of the N-Gain Score test analysis consisted of 20 respondents, the average of the intervention group (pre-post 1) was 0.31 or 31%, the intervention group (pre-post 2) had an average of -0.15 or -15%, the intervention group (pre-post 3) mean of -0.35 or -35% and the intervention group (pre-post 4) mean of -0.46 or -46% so it can be concluded that the Normalized gain score is in the medium category in pre-post intervention 1 namely, the light intensity of a 5 watt lamp with the interpretation category in N-Gain Percent is included in the ineffective category.



The results of the N-Gain Score test analysis consisted of 20 respondents, the average in the control group (pre-post 1) was -0.00 or -0%, the control group (pre-post 2) average was -0.10 or -10%, the control group (pre-post 3) has a mean of -0.14 or -14%, the control group (pre-post 4) has a mean of -0.07 or -7% so it can be concluded that the Normalized Gain Score control group is included in the category low and falls into the category of interpretation of the effectiveness of N-Gain Percent as ineffective, namely the use of light that is normally used.

## **DISCUSSION**

Based on the results of the analysis of the characteristics of age respondents from the two groups in this study, it shows that the age range for the intervention group and group is 60 to 80 years and 60 to 84 with a mean of 66.85 and 66.50, which is the elderly category. This is in line with the opinion of Siti (2008) in Article 1 paragraph 2,3,4 of Law No. 13 of 1998 (Thomas, 2016) regarding the health of the elderly as someone over 60 years of age (Thomas, 2016). This makes the elderly experience an aging process which is in line with the statement of the Indonesian Ministry of Health (2008) in Thomas (2016) that aging is a natural process that runs continuously, cannot be avoided and is continuous and causes anatomical, physiological and biochemical changes that affect function and ability. body as a whole (Thomas, 2016). So, the older a person gets, the more changes and complaints there will be in the body, one of which is changes in sleep which affect the sleep quality of the elderly.

Based on the results of the analysis of the characteristics of gender respondents in both groups, it was found that women experienced more problems, one of which was changes in sleep quality. This is in line with research conducted by Fajar Sidik and Mokhamad Arifin (2017), namely that there are more elderly women than men, as evidenced by the results of statistical data by Wreksoatmodjo, B. R (2013) that the number of elderly people in Indonesian Nursing Homes in 2002 was female. far more than 5830 for men compared to 2552 for men.

This shows that one of the factors is that women's life expectancy is longer, so that the problems of the elderly in general in Indonesia, such as problems with sleep quality, are dominated by women based on statistical data from STMIK Jakarta (Sidik, 2017). Based on the results of the frequency distribution analysis of elderly sleep quality before and after being given light intensity treatment, the average sleep quality increased with reduced sleep complaints when using a 5 watt lamp light intensity. This is in line with research by Anisa Furtakhul Janah, Upik Nurbaiti and Fianti (2020), namely recognizing the activities that will be carried out in a room so that you can pay attention to choosing the right light because the right lighting can increase comfort in the bedroom.

According to research by Anisa Furtakhul Janah, Upik Nurbiati and Fianti (2020), choosing the right and appropriate lamp for the bedroom will create a comfortable situation, namely the recommended position when the lamp is turned off or has a minimum lighting level. Based on the results of the frequency distribution analysis of the elderly's sleep quality before and after without treatment, the average did not show much improvement, so it can be concluded that there was no change in the elderly's sleep quality. This is in line with research by Parmonangan Manurung (2016) that sufficient or moderate bedroom lighting can affect the safety of elderly people who experience decreased balance, physical ability and vision, so lighting design is needed that is well designed and adapts to the needs of the elderly.

**Bivariate Analysis:** Before testing the two groups, normality and homogeneity tests are required to determine which test will be used after knowing the results. The results of the normality test in the pre-post intervention and control groups were normally distributed. Meanwhile, the results of the homogeneity test in the intervention and control groups showed a homogeneous distribution in the pre-post test. The results of data analysis on elderly sleep quality which had a normal and homogeneous distribution, the next stage was carried out for paired tests, namely paired-tests and unpaired tests, namely independent sample t-tests. Based on the results of the paired-test analysis, it was found that the light intensity of the lamps that had an influence on the sleep quality of the elderly were 5, 15 and 20 watt lamps with p values of 0.01, 0.00 and 0.00, which can be concluded that  $H_0$  was rejected and  $H_a$  was accepted.

This is in line with the results of research by Anisa Furtakhul Janah, Upik Nurbaiti and Fianti (2020) which shows that there is an influence on the use of light intensity and a person's comfort level with yellow lamps being more comfortable to use in the bedroom according to the results of the questionnaire, likewise round lamps are more suitable for use for the bedroom compared to spiral and essential. The research results of Fajar Sidik and Mokhamad Arifin (2017) show that there is a relationship between room lighting during sleep and the sleep quality of the elderly. Using dark lighting can improve the sleep quality of individuals, especially the elderly. Based on the results of the paired-test in the control group, it was found that there was an influence when filling out the questionnaire to measure the sleep quality of the elderly using the intensity of light that is usually used, namely when filling in the third questionnaire, so it can be concluded that  $H_0$  was accepted and  $H_a$  was rejected. From these results, it can be concluded that apart from environmental factors, there are other factors that cause elderly people to experience disturbances in sleep patterns apart from the dependent and independent variables studied, so further research is needed on other disturbing factors.

This is in line with the results of research by Irwina Angelia Silvanasari (2012), namely that it is necessary to assess sleep quality in the card for health (KMS) for the elderly so that problems with symptoms of sleep quality disorders in the elderly can be identified and treated early. One factor in changes in sleep quality is the living environment, especially the intensity of light, which can affect the sleep quality of the elderly. The results of Parmanongan Manurung's research (2016) are that the design of the space where the elderly live in the interior lighting at the Peradan Padudan Nursing Home must be considered which has an impact on the comfort of the elderly. Based on the results of the unpaired test, it was found that there was a difference between the intervention and control groups, namely when using a 5 watt lamp, so it could be concluded that  $H_0$  was rejected and  $H_a$  was accepted.

This is in line with the research results of Anisa Furtakhul Janah, Upik Nurbaiti and Fianti (2020) showing that there are differences in light intensity tested with color variations, namely Yellow, Red, Green and Blue which provide comfort for a person's bed when using a lamp. yellow in color and has a variety of shapes, namely round, spiral and essential which are suitable for someone's bedroom when using a round lamp shape. The research results of Fajar Sidik and Mokhamad Arifin (2017) show that choosing the right lights in the bedroom is generally used for sleeping in the most comfortable condition, namely when the lights are turned off or at the minimum lighting level, it can improve the sleep quality of the elderly.

The results of Parmanongan Manurung's research (2016) show that interior lighting in nursing homes does not evenly meet the lighting needs of the elderly, which is still

considered adequate or moderate by the elderly living there, so it requires a room lighting design that suits the needs of the elderly in their sleeping rooms. Based on the results of the paired-test analysis, it was found that there was an influence on the three levels of lamp light intensity, namely 5, 15 and 20 watts. From these results, further tests need to be carried out to determine the gain score so that the results can be categorized into high, medium and low at the same time. categorize the effectiveness interpretation into the categories of ineffective, less effective, quite effective or effective. Based on the results of the Normalized gain score analysis test, those with moderate and ineffective scores were in the intervention group when using 5 watt light intensity. This ineffectiveness can be overcome by testing confounding variables because in the paired test there was an influence in the control group when using the light intensity that is usually used so that in this study the presence of other factors (disturbing factors) that the researchers did not test became a problem in the sleep quality of the elderly.

## CONCLUSION

Based on the results of data analysis, it can be concluded that the use of light intensity influences the level of sleep quality of the elderly. Lamps with a light intensity of 5 watts with the same type, shape and color can improve the sleep quality of the elderly. This is supported by the results of the questionnaire which states that the number of elderly people's sleep quality has increased and fewer people experience complaints in their sleep after being given the intervention in the mild category.

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None

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## Original Research

**Cholesterol, Blood Glucose and Hemoglobin Profiles of Urban Adolescents****Yuyun Setyorini<sup>1</sup>, Rendi Editya Darmawan<sup>2\*</sup>, Yopi Harwinda Ardesa<sup>3</sup>, RR Sri Arini Winarti Rinawati<sup>4</sup>, Rini Wuri Astuti<sup>5</sup>**<sup>1,2</sup> Department of Nursing, Poltekkes Kemenkes Surakarta, Indonesia<sup>3</sup> Department of Nutrition & Dietetics, Poltekkes Kemenkes Mataram, Indonesia<sup>4</sup> Department of Nursing, Poltekkes Kemenkes Medan, Indonesia<sup>5</sup> Department of Nutrition & Dietetics, Poltekkes Kemenkes Yogyakarta, Indonesia**ABSTRACT**

**Background:** Prevention of heart and cardiovascular disease must be carried out as early as possible with routine biochemical examinations. Aim of this study is to describe the profile of Cholesterol, Blood Glucose and Hemoglobin in urban adolescents.

**Methods:** This research method uses a descriptive design with a cross sectional approach. The sample population in this study was 63 nursing students at the Surakarta Health Polytechnic. The study was conducted in August 2023 and the sample was selected randomly. Data were analyzed descriptively.

**Results:** The average cholesterol level was 197mg/dl, the average blood sugar level was 91.1 mg/dl and the average hemoglobin was 13.2 g/dl.

**Conclusion:** The incidence of hypercholesterolemia was high in respondents. This condition is possible due to insufficient consumption of vegetables and lack of physical activity resulting in high cholesterol levels. These specific findings can help create policies to develop more strategic evidence-based interventions, through grouping risk factors in controlling the risk of non-communicable diseases in adolescents.

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adolescents; blood glucose; cholesterol; hemoglobin; non communicable diseases

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**INTRODUCTION**

Non-communicable diseases (NCDs) are the most common causes of long-term illness, disability and premature death worldwide (Majić et al., 2023). PTM is considered a disease that does not involve microbial influence and is only influenced by lifestyle factors (Budreviciute et al., 2020). Non-communicable diseases (NCDs), also known as chronic diseases, last a long time and are the result of a combination of genetic, physiological, environmental and behavioral factors in diabetes (WHO, 2021). The factors identified as the main determinants of NCD prevalence are hypertension, increased total cholesterol, tobacco use, alcohol consumption, lack of physical activity, unhealthy eating patterns, obesity, and increased blood sugar. This shows that the

majority of NCDs are caused by risk factors, which can be prevented (Majić et al., 2023). Non-communicable diseases target all groups, men, women, children, and people in all groups with the condition that someone may look healthy, but they may suffer from these diseases. One of the most serious concerns regarding non-communicable diseases is that these diseases attack people at the productive age of their lives, making them the main cause of premature death (Balsarkar, 2022).

Despite the fact that non-communicable diseases are usually associated with the elderly population, basically non-communicable diseases are very risky at all age levels. Evidence shows that every year, 17 million people die from NCDs before the age of 70 years 86% (WHO, 2021). In America, non-communicable diseases occur in 15 million people - 2.2 million in America between the ages of 30 and 69 years, this condition causes premature death, reaching more than 85% of deaths (PAHO, 2021). Of all deaths due to NCDs, there are four large groups that account for more than 80% of all premature deaths. Cardiovascular disease is the leading cause of NCD deaths, or 17.9 million people each year, followed by cancer (9.3 million), chronic respiratory disease (4.1 million), and diabetes (2.0 million including deaths due to kidney disease which caused by diabetes) (WHO, 2021). In Indonesia, PTM was the main cause of death in 2016. PTM was responsible for 73% of death incidents with the proportions being cardiovascular disease (35%), cancer (12%), chronic respiratory disease (6%), diabetes (6%), and risk of premature death is more than 20% (Arifin et al., 2022).

We are now living in the midst of a global syndemic—which is a synergy of three parallel epidemics occurring simultaneously—namely NCDs, social inequality, and the corona virus disease (COVID-19). As a result, traditional societies are limited in dealing with risk factors and diseases that continue to develop. (Canfell et al., 2022). Poor lifestyle or behavioral patterns, lack of physical activity, unhealthy eating patterns, tobacco use (smoking, passive smoking), and dangerous alcohol use increase the risk of non-communicable diseases (Canfell et al., 2022). In Sub-Saharan Africa (SSA), the problem of NCDs and their risk factors is increasing with some experiencing symptoms of anemia, increased blood lipids and obesity, increased blood glucose, increased blood pressure, etc. (Yaya et al., 2018). Therefore, in this case, initial screening for NCD treatment, as well as palliative care, is a key component in the response to NCDs, including checking cholesterol, blood glucose and hemoglobin levels, especially among adolescents to control risk factors for death at an early age (Ministry of Health of the Republic of Indonesia, 2018; PAHO, 2021)

Lifestyle modification and appropriate interventions are a top priority in disease prevention and to reduce the risk of NCDs (Budreviciute et al., 2020). Most non-communicable disease conditions can be reduced by addressing behavioral risk factors such as tobacco use, alcohol abuse, inappropriate eating habits, obesity, and lack of adequate physical activity. Non-communicable diseases and their consequences are generally preventable, but lack of patient knowledge, attitudes, and practices can be important factors influencing the selection and implementation of health promotion behaviors to achieve a healthy lifestyle (Ramesh & Kosalram, 2023). In overcoming the epidemic situation of Non-Communicable Diseases, great determination is needed to continue providing education to the entire community to adopt a healthy lifestyle (Balsarkar, 2022). In order to achieve large-scale progress, collaboration between the government and various non-governmental organizations, schools and universities, to provide advice on lifestyle changes and warn the public about the risks of NCDs, is



urgently needed. However, to achieve the highest attainable health standards, it is important to encourage individuals and families to live a healthy lifestyle in order to achieve an effective response in the prevention and control of NCDs and improve health outcomes (Budreviciute et al., 2020) . So further studies are needed on integrated development of risk factors for non-communicable diseases in higher education health institutions.

## MATERIALS AND METHOD

This research method uses a descriptive design with a cross sectional approach. The population in this study were Surakarta Health Polytechnic students with a total of 63 respondents. The sampling technique is total sampling. In this research, data collection for each variable uses a questionnaire. Biomedical examination of respondents was carried out after signing the informed consent which included taking blood samples and then these samples were analyzed for examination, cholesterol, blood glucose and hemoglobin.

## RESULTS

Survey results of 63 respondents consisting of The average age is 21 years (69.8%) and the majority of respondents are female (95.2%). The results showed that the average cholesterol was 197, the average blood sugar level was 91.1 and the average hemoglobin was 13.2.

Variables	Frequency	Percentage
<b>Age</b>		
20	14	22.2
21	44	69.8
22	5	7.9
<b>Gender</b>		
Man	3	4.8
Woman	60	95.2
<b>Cholesterol</b>		
Mean	197	
Median	196	
Mode	189	
<b>Blood sugar</b>		
Mean	91.1	
Median	86	
Mode	85	
<b>Hemoglobin</b>		
Mean	13.2	
Median	12	
Mode	11.8	

## DISCUSSION

It is known that there are four main types of non-communicable diseases, including cardiovascular disease, cancer, chronic respiratory disease and diabetes (WHO, 2021) . Among all respondents in this study, indicators of non-communicable diseases include high cholesterol levels, high blood sugar levels, and high and low hemoglobin

concentrations detected at age (20-22 years) with an average cholesterol reaching 197, blood sugar 91.1 hemoglobin. 13.2 where these figures must be taken into account (ADA, 2018; Billett, 1990; Grundy et al., 2019) . When compared with the United States during 2015–2018, the prevalence of high total cholesterol in adults aged  $\geq 20$  years was 11.4%, and there was no significant difference between men (10.5%) and women (12 .1%) (Margaret, 2020) . In the United States 1.6 million adults aged 20 years or older—or 5.7% of all US adults diagnosed with diabetes—report having type 1 diabetes and using insulin (CDC, 2022) . In the United States Regionally in 2019, the prevalence of anemia in women of childbearing age (women aged 15–49 years) was 15.4% (95% uncertainty interval (UI) 12.1–19.5), equivalent to 39 million women suffering from anemia (Finucane et al., 2015) .

Meanwhile in Indonesia, the prevalence of hypercholesterolemia in Indonesia in the 15-34 year age group is 39.4% and increases with age (Nasrul, 2022) . It is estimated that the adult diabetes population aged between 20-79 years is 19,465,100 people or the prevalence of diabetes among those aged 20-79 years is 10.6% (Sutadarma, 2022) . According to 2013 Riskesdas data, anemia in women (23.9%) is relatively higher in men (18.4%). There are 18.4% aged 15-24 years experiencing anemia. This means that in Indonesia around 1 in 5 teenagers suffer from anemia (Ministry of Health of the Republic of Indonesia, 2021) . The prevalence obtained in this study is sufficient to conclude that Indonesian teenagers already suffer from risk factors for non-communicable diseases at their productive age.

Of the four types of main components, the relationship between high cholesterol levels and low or high hemoglobin concentrations, the relationship between cholesterol levels and blood glucose levels, the relationship between cholesterol levels and the incidence of cancer are interrelated with an increase in cardiovascular disease and all causes of death (Lee et al., 2018) . High cholesterol is a condition in which the body has too many lipids in the blood. The body needs the right amount of lipids to function. However, if the body has too much lipid, the extra lipid will build up in the arteries , combining with other substances in the blood and causing the appearance of atherosclerotic plaque. High cholesterol increases the risk of conditions such as peripheral artery disease, high blood pressure, and stroke (Cleveland Clinic, 2022) .

In addition, high cholesterol levels are closely related to hemoglobin levels which are related to the size of lipoprotein particles. Where high hemoglobin levels are associated with larger VLDL particle sizes, smaller LDL particle sizes and, smaller HDL particle sizes increase the number of VLDL and LDL particles. So several studies have concluded that high hemoglobin concentrations are related to bad lipoprotein particles, these bad protein particles can also increase the risk of heart disease , diabetes and metabolic syndrome (Hämäläinen et al., 2018) . Several potential mechanisms may explain how low hemoglobin concentrations increase the risk of CVD-related and all-cause mortality. One of them is that anemia status can cause ventricular remodeling and cardiac dysfunction. Chronic anemia with hemoglobin  $< 10$  g/dL is known to cause increased cardiac output which can cause left ventricular hypertrophy (Lee et al., 2018) . So maintaining hemoglobin concentrations in the normal range correlates with a reduction in all-cause mortality (Lee et al., 2018) .

In addition, increased serum glucose and cholesterol levels have been shown to be associated with increased mortality from cardiovascular disease and all-cause mortality. Hypercholesterolemia is a risk factor for cardiovascular disease in type 2 diabetes patients. In addition, the relationship between high cholesterol levels and an increased

risk of cancer has long been of interest and investigation because the cholesterol synthesis pathway can produce various tumorigenic compounds and because cholesterol functions as a precursor for the synthesis of many related sex hormones. with an increased risk of various types of cancer (Ding & Hu, 2008) . The pathogenesis of diabetes mellitus is very complex, diabetes mellitus is caused by various factors and mechanisms that work together. Abnormal lipid metabolism is an important factor in the development of diabetes mellitus and an important cause of its complications . Lipid metabolism disorders include, among other things, increased serum triglyceride levels and decreased serum high-density lipoprotein cholesterol. Lipid metabolism disorders play an important role in the pathogenesis of diabetes (Wang et al., 2023)

Diabetes mellitus (type 1 diabetes and type 2 diabetes) doubles the risk of coronary artery disease and peripheral artery disease. Diabetes is associated with lower HDL levels and higher levels of triglycerides and LDL. About 7 in 10 people with type 2 diabetes are diagnosed with diabetes-related dyslipidemia. This means they have high levels of triglycerides, high levels of “small density” LDL, and low levels of HDL. “Low dense” LDL is a specific type of cholesterol protein that can easily enter artery walls and cause damage. Having too much small dense LDL in your blood can cause plaque growth (Cleveland Clinic, 2022) . Given the global economic and social burden of non-communicable diseases, understanding risk factors for non-communicable diseases that can be intervened in can help reduce the economic burden on countries and individuals. Active and effective prevention of risk factors can lead to early detection of non-communicable diseases, facilitate timely and effective treatment, reduce and delay the occurrence and development of complications, improve patient quality of life, reduce disability rates and extend life expectancy. (Wang et al., 2023)

In this case, the causes of the emergence of risk factors for non-communicable diseases among the productive age group are closely related to changes in the environment, lifestyle and technology in Indonesia. Risk factors such as poor diet, smoking, sedentary behavior, and being overweight/obesity increase the risk of NCDs. Investigations show that behavioral risk factors are often acquired in adolescence and then implemented in adulthood ( Pengpid & Peltzer, 2019 ) . Among adolescents aged 10-20 years, lack of physical activity and sedentary behavior (e.g. watching television, playing games, and use of computers and smartphones) have been associated with increased obesity and fat, poor diet (insufficient fruit and vegetable consumption , salt, foods sweetened with sugar), drinks and consumption of saturated fats, low iron, etc.), depression, causing a decrease in the quality of life of the productive age ( Nilsen et al., 2020; Tremblay et al., 2016) .

Globally, unhealthy eating patterns, especially due to consumption of sugary drinks and saturated fats, increase the risk of CVD (Afshin et al., 2019) . Prevention and control of NCDs has emerged as a global priority in the Sustainable Development Goals in encouraging early prevention and control of NCD risk factors. , a number of countries, including Australia and Canada, have reformed their national strategies on preventing NCD risk factors by highlighting the importance of physical activity, sleep and proper nutrition during childhood and adolescence (Nilsen et al., 2020; Tremblay et al. , 2016) . Global health leaders also emphasize the importance of preventing and controlling NCDs at key stages of life, particularly during adolescence. Due to greater plasticity, adolescence is considered an important time to intervene and disrupt pathways to poor health in adulthood (Biswas et al., 2022) . We found that insufficient consumption of fruit and vegetables, and lack of physical activity were the most common risk factors across

the region. In almost all countries, more than 40% of teenagers are not physically active, and consume less fruit and vegetables. Proper nutrition during adolescence is critical for current, future, and intergenerational health (Victora et al., 2008) .

It is recommended that countries implement prevention approaches that target clusters of risk factors for preventing NCDs among adolescents. limited resources, in targeting the burden of NCD risk factors among adolescents. School health promotion is known as an effective approach to combat NCD risk factors among adolescents. However, although health-promoting school approaches are promoted, with guidance provided on their development and implementation, we found that less than half of LMIC countries have rigorously implemented their respective national health-promoting school guidelines. The lack of health-promoting schools may be due to a lack of open spaces for physical activity or sport, particularly in urban areas (Biswas et al., 2022) . A study by Sharma et al. reported that school-based Health Promotion has a positive impact on behavior that can cause risk factors for non-communicable diseases (Sharma et al., 2018) .

## CONCLUSION

The prevalence of three or more NCD risk factors is very large and varies between countries. Insufficient vegetable consumption, insufficient fruit consumption, and lack of physical activity are the most common causal factors in all regions. These specific findings can help shape policies to develop more strategic evidence-based interventions. Health promotion in schools can prevent risk factors, however, education-based interventions in schools require deeper understanding and attention to complex patterns and strategic grouping based on risk factors can avoid the burden of NCDs in adolescents.

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## Original Research

**Application of the PRECEDE-PROCEED Model in the Development of Community-Based Daily Emergency First Aid Management Training**Addi Mardi Harnanto<sup>1</sup>, Sunarto Sunarto<sup>2\*</sup><sup>1,2</sup> Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia**ABSTRACT**

**Background:** Emergency conditions in society can occur at any time, posing a threat to society's health and aligning with SDGs ideals. To reduce mortality and morbidity rates, community members need first aid competency and a health promotion model for prepared workers. The aim of this study is assessing the effectiveness of the Application of the Precede and Proceed Model in the Development of Community-Based Daily Emergency First Aid Management Training

**Methods:** A mixed method of qualitative and quantitative research with research and development (R&D) research was applied to produce a training model for the community. The study was conducted at July-October 2023. The informants for the first stage of training were six people from the Health Service, PSC 119, PSC 119 of partner universities, doctors and nurses at the Community Health Center, village government, and health cadres. In the second stage of research Health Promotion Model was tested in phase two on 50 health cadre who were randomly divided into intervention and control groups. Both group was evaluated with pre-post test.

**Results:** In the first stage of the study, input was found regarding the development of appropriate training for the community. Meanwhile, the second stage of the study was found Community-Based Daily Emergency First Aid Management Training gives a positive effects in knowledge, skills, and attitude of respondent with sig 0.00.

**Conclusion:** The conclusion of this research is that the Community-Based Daily Emergency First Aid Management Training Model increases community competence in carrying out first aid for everyday emergency situations. The PRECEDE-PROCEED Model can be applied to develop training for the community in the future.

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cardiac arrest; cardiac attack; community-based training; first-aid precede-proceed model

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**INTRODUCTION**

The United Nations (UN) has launched the 2016-2030 *Sustainable Development Goals* (SDGs) as the ideals for sustainable development of world society as a continuation of the *Millennium Development Goals* (MDGs). Emergency conditions that



occur in society can occur at any time and anywhere. If this emergency condition is not handled properly, it will result in the threat of death and disability for society, which is certainly not in line with the SDGs ideals that have been proclaimed (United Nation, 2016). First *aid* is immediate assistance given to sick or injured people until professional help arrives at the scene in order to prevent death and disability (Federación Internacional de Sociedades de la Cruz Roja y de la Media Luna Roja (IFRC), 2016) . A person who finds a victim in an emergency condition is known as a *Community First Responder (CFR)* . CFR plays a very important role for victims in emergency conditions in saving lives. CFRs are members of the community who are volunteers who have received training or outreach to help people who experience medical emergencies while waiting for an ambulance to be on its way (Kindness et al., 2014) .

First aid services in emergency conditions are regulated by Minister of Health Regulation Number 19 of 2016 concerning the Integrated Emergency Service System. In this regulation, local governments are required to prepare a structured service called *Public Safety Center 119* (Ministry of Health of the Republic of Indonesia, 2016). Regulation of the Minister of Health of the Republic of Indonesia Number 47 of 2018 concerning Emergency Services divides emergency services into pre-facility health services, intra-facility health services and inter-facility health services. Pre-facility emergency services are quick and precise actions to help patients at the scene of the incident, playing a very important role in saving lives and preventing disability with services including triage, resuscitation, initial stabilization and evacuation. In the pre-health care service phase, the role of the community is very important, so the government is obliged to develop the community as first responders to improve the quality of first aid (Indonesian Ministry of Health, 2018).

Literature reporting on the empowerment and development of CFR in Indonesia is still very limited. In developed countries, community empowerment as CFR in providing first aid for emergency victims is very good although it still needs development. The results of a study in the United Kingdom, showed that CFRs' contribution to services increased, felt they were making a valuable contribution and hoped to maintain basic skills while having the opportunity to develop themselves (Phung et al., 2018). Studies in Scotland show that the role of CFR is closely related to volunteerism (Roberts et al., 2014). Based on Minister of Health Regulation Number 47 of 2018, emergency services have not yet shown maximum results and many people complain when they need help. One component in supporting the success of first aid is community participation. The role of the community when finding victims of emergency conditions is to remove objects that could cause more victims, ask for help from local residents, officers and security officers, contact the 119 call center or other help numbers and provide first aid using the 119 call center guide (Indonesian Ministry of Health , 2018).

Based on an interview with the Head of the Emergency Room at a government hospital in Surakarta City at the early of 2023, all patients with emergency conditions who were referred to the hospital had not received adequate first aid from the community as first responders. A preliminary study using *survey* techniques conducted on 22 health cadres who had taken part in the socialization of emergency first aid found that 22 respondents (100%) stated that they had high motivation in providing first aid. The majority of respondents (20 cadres = 90%) have low knowledge in identifying

emergency conditions that occur in the community. The majority of respondents (21 cadres = 98%) stated that they did not understand the procedures for asking for help from the health team, either by accessing *call number 119* or the nearest hospital and how to provide appropriate first aid.

One model that is widely used as a theoretical basis for developing a health program is the *Precede-Proceed Model*. is a *Precede-Proceed Model* for planning and evaluating health programs widely taught and used in Anglophone health promotion practice, with over 1000 published applications (Green et al., 2005). This study showed that people with better knowledge are more likely to engage in health-related behaviors. Therefore, the PRECEDE-PROCEED Model can be used as a theoretical framework for health promotion interventions in different populations, and these interventions are particularly effective in terms of improving knowledge (Kim et al., 2022).

Previous studies show the effectiveness of applying the PRECEDE-PROCEED Model to increase knowledge and skills of community in the health sector. The results of the previous study confirmed the effectiveness of the PRECEDE-PROCEED model-based educational program for the prevention of LBP by improving a number of model structures (Pourhaji et al., 2020). Another previous research shows the "Precede-Proceed Health" health promotion model impacts child growth, nutritional status, and quality of life. To plan community empowerment programs, comprehensive needs assessments using literature reviews and surveys are essential. Quality of life is assessed based on education, economic status, social capital, and environment (Wahyuningsih et al., 2022). What this research has in common with previous studies is that they both examine the application of the PRECEDE-PROCEED Model, but this research focuses on the field of emergency situations in the community.

It is necessary to increase the number of community members who have first aid competency so that it can reduce mortality and morbidity rates. In an effort to increase the number of first aid workers who are prepared to provide first aid, a health promotion model is needed in first aid in emergency cases. Based on the background description above, it is deemed necessary to conduct research with the theme "Application of the Precede & Proceed Model in the Development of Community-Based Daily Emergency First Aid Management Training."

## **MATERIALS AND METHOD**

A mixed method of qualitative and quantitative research with research and development (R&D) research was applied to produce a training model for the community. The first phase (qualitative research) was carried out to explore and analyze problems and develop a health promotion model design. The second phase (quantitative research) consisted of testing the model on a limited group, refining the model, and implementing the program on a larger group using a pre-posttest with control group experimental method approach. The main output of this research is the production of a community empowerment model in the form of training to increase community readiness in providing first aid for cardiac attacks and cardiac arrest patient.

The first phase of research was carried out from July 2023 in Surakarta. The research sample was selected using a purposive sampling technique to obtain informants who have policies and are involved in developing health promotion programs, especially in developing training for communities to increase readiness to provide first aid for victims of cardiac attacks and cardiac arrest. Informants in this first research

stage consisted of six people from the Health Service, PSC 119 staffs, doctors and nurses at the Community Health Center, village government, and health cadres. Data at the exploration and analysis stage was obtained from problem identification through in-depth interviews, documentation studies, and observations followed by analysis of more specific problem determinants, identification of factors that support community readiness in providing assistance to victims, as well as regulatory analysis. Researchers then developed a first aid training model for emergency victims based on the needs and characteristics of the community with reference to the results of the analysis in the first stage.

The second phase of research consisted of testing the model in a limited group was carried out from July-October 2023 in Surakarta.. Samples came from community groups consisting of health cadres who had received education from the Surakarta City Health Office/PSC-119 and/or partner institutions regarding first aid for daily emergency conditions. The number of samples in the first small trial group was 50 people who were randomly divided into two groups; 25 people in the intervention group and 25 people in the control group. All respondents were asked to do a pretest before being given the intervention. The intervention group was given the health promotion model developed in the first phase of the research, while the control group was given a model that had been previously developed by the health service. After being given the intervention, all respondents were again asked to take the post test.

The resulting training model is training that is preceded by an assessment of learning needs. The training curriculum is prepared based on the results of the learning needs study. Learning methods in the form of theory, demonstration and role-play are prepared with complete tolls. Complete media and learning aids to facilitate theoretical, practical and role-play learning. Evaluation tools include test sheets to assess knowledge, skills checklists to assess skill domains and scenario guides to assess role-play results. The trainers in this training are a combination of lecturers and practitioners who were previously provided with training in the training of trainers. Training is carried out once and evaluation activities are carried out directly after the training is completed.

Ethical clearance for this research was obtained from the Health Research Ethics Committee of the Regional General Hospital, dr. Moewardi with the registration number 1.304/VII/HREC/2023.

## RESULTS

In-depth interviews from the first phase of research based on interview guidelines which referred to the stages of developing training for the community provided the results as presented in table 1.

**Table 1. Analysis of Qualitative Research Results**

<b>Themes Of Study</b>	<b>Informant's Statement</b>
Needs analysis	<ul style="list-style-type: none"> <li>a. A needs assessment has never been carried out for any training carried out for the community.</li> <li>b. Indirectly, nurses who accompany community empowerment activities carry out training needs assessments based on health problems that arise in an area.</li> <li>c. The theme of the training carried out was not a suggestion from the</li> </ul>

Themes Of Study	Informant's Statement
	<p>community/health cadres, the resource person immediately received a letter of assignment to provide certain training.</p> <p>d. Never been assigned to carry out a training needs assessment for the community.</p> <p>e. Cadres have never been directly involved in training planning.</p> <p>f. Cadres take part in training activities based on invitations and assignments from sub-district heads.</p>
Setting training goals	<p>a. Training objectives are determined based on the program holder's suggestions.</p> <p>b. Most training objectives are formulated based on findings of health problems in an area.</p> <p>c. The aim of the training is to follow the assignment warrant.</p> <p>d. Have never read the training objectives document other than the training assignment letter.</p> <p>e. Cadres know the purpose of the training from the invitation letter and explanation from the resource person.</p> <p>f. Feeling that they have never been involved in formulating training objectives.</p>
Training Design	<p>a. The training carried out for the community is not yet equipped with a curriculum and tools.</p> <p>b. The training for the community that has been carried out so far is still just a socialization program based on the latest government programs and current health problems.</p> <p>c. There is no curriculum for training for the community.</p> <p>d. Never read or found a training curriculum for the community.</p> <p>e. Cadres have never received a training curriculum for the community.</p> <p>f. Lack of understanding that training must be equipped with a curriculum and tools.</p>
Implementation of Training	<p>a. The training is mostly program based and is carried out only in a short time (on average half a day of activity).</p> <p>b. The implementation of the training seemed lacking in proper planning, carried out in a short time, carried out on weekdays so that participants were less than optimal.</p> <p>c. The training was carried out in only a very short time (half a day).</p> <p>d. The training implementation time is adjusted to the budget and SPj activities so that it is less than optimal.</p> <p>e. A lot of training is carried out on weekdays so that working cadres find it very difficult to follow, training in a short period of time is less than optimal in terms of results.</p> <p>f. Implementation is less than optimal because time is very limited.</p>
Training Evaluation	<p>a. Evaluation is only carried out using a very simple method, namely through a feedback process during training implementation, no follow-up on training results is carried out within a certain period of time.</p> <p>b. There are no effective evaluation methods that have been implemented, for example pretest-posttest for the cognitive domain and action checklists for the psychomotor domain.</p> <p>c. Evaluation is carried out by means of questions and answers during training only.</p> <p>d. A good evaluation model has not been implemented when implementing training.</p> <p>e. There is no evaluation process during training and follow-up on training results from the organizer.</p> <p>f. Only ask questions about the material during the training, there are no tests or measurements of skills during the training with demonstrations/simulations.</p>

Themes Of Study	Informant's Statement
Training Funding	<ul style="list-style-type: none"> <li>a. Most of the funding from local governments comes from university community service activities.</li> <li>b. Funding from city government.</li> <li>c. Based on office budget.</li> <li>d. Funding sources are obtained from annual programs.</li> <li>e. Training is funded by the government.</li> <li>f. Training receives funding allocation from the government.</li> </ul>
Enter improvements	<ul style="list-style-type: none"> <li>a. Training development is based on the stages of <i>training needs assessment</i> , <i>setting training objectives</i> , designing training , implementing training and evaluating <i>training</i> . People prefer training with simulation or <i>roleplay models</i> .</li> <li>b. Training was developed based on training development theories starting from need assessment to good evaluation, interactive and interesting learning media were prepared, such as short and not boring learning videos.</li> <li>c. Adding interesting learning media for the community.</li> <li>d. People prefer simulation and roleplay methods.</li> <li>e. The cadres proposed increasing the number of simulations and rehearsals.</li> <li>f. The realm of practice is expanded rather than theories because cadres need skills to be applied directly.</li> </ul>

Based on the results of the interview, a model was prepared which was then tested in a small groups respondents. Results of univariate analysis on the characteristics of small group respondents is shown in table 2.

**Table 2. Respondent Characteristics**

Characteristics	Intervention Group (n = 25)		Control Group (n = 25)	
	n	%	n	%
<b>Sex</b>				
Male	12	48.0	8	32.0
Female	13	52.0	17	68.0
<b>Total</b>	<b>25</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>
<b>Age (years old)</b>				
<20	3	12.0	3	12.0
20-30	6	24.0	9	36.0
31-40	6	24.0	3	12.0
41-50	5	20.0	7	28.0
>50	5	20.0	3	12.0
<b>Total</b>	<b>25</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>
<b>Educational Background</b>				
Junior High School	2	8.0	0	0
High School	11	44.0	16	64.0
Diploma/bachelor	12	48.0	8	32.0
Postgraduate	0	0	1	4.0
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>
<b>Occupation</b>				
Government officials/soldiers/police	3	12.0	3	12.0
Entrepreneur	8	32.0	12	48.0
Farmer	2	8.0	0	0.0
private sector employee	3	12.0	8	32.0
housewife	9	36.0	2	8.0
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>
<b>Length of Cadre</b>				
<3 years	3	12.0	3	12.0

Characteristics	Intervention Group (n = 25)		Control Group (n = 25)	
	n	%	n	%
3-6 years	8	32.0	12	48.0
7-9 years	8	32.0	9	36.0
>10 years	6	24.0	1	4.0
<b>Total</b>	<b>25</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>

Table 2 shows that the majority of respondents were female, of which there were 13 people (52.0%) in the intervention group and 17 people (68.0%) in the control group. Based on age, the majority of respondents in the intervention group were 20-30 years old (25%), as were those in the control group (36%). Based on educational background, most of the respondents in the intervention group had a diploma/bachelor's degree (48%), while those in the control group had high school (64.0%). Based on occupation, the intervention group was dominated by housewives (36%), while the control group was self-employed (48%). Meanwhile, based on the length of time they have been a cadre, the majority of respondents in the intervention group have been cadres for 3-6 years (32%), as have those in the control group (48%).

Respondents in both groups were evaluated through pre-test and post-test which results is shown in table 3.

**Table 3. Pretest-Post Test Comparison**

Domain		Intervention Group	Control Group	T-Test Sig.
Knowledge	Mean Pretest	62.76	62.00	
	Mean Posttest	86.80	73.88	0.0
	Mean Difference	24.04	11.88	
Skills	Mean Pretest	63.16	64.64	
	Mean Posttest	85.80	84.12	0.0
	Mean Difference	22.04	19.48	
Attitude	Mean Pretest	65.60	65.60	
	Mean Posttest	85.08	76.00	0.0
	Mean Difference	19.48	10.40	

Table 3 shows that both groups show an increase in scores of knowledge domain. The increase in the score in the intervention group was 24.04, while the difference in the increase in the control group was 11.88. The results of the difference test show Sig 0.00 so it can be concluded that there is a significant difference in the increase in scores between the intervention group and the control group. As in skills domain, the table shows that both groups show an increase in scores in the skills domain. The increase in the score in the intervention group was 22.64, while the difference in the increase in the control group was 19.48. The results of the difference test show Sig 0.00 so it can be concluded that there is a significant difference in the increase in scores between the intervention group and the control group. Both groups also shows an increase in scores for the attitude domain. The increase in the score in the intervention group was 19.48, while the difference in the increase in the control group was 10.4. The results of the difference test show Sig 0.00 so it can be concluded that there is a significant difference in the increase in scores between the intervention group and the control group.

## **DISCUSSION**

The results for both groups showed an increase in scores in the domains of knowledge, skills and attitudes. However, the difference between pre-test and post-test scores in the intervention group was significantly higher than in the control group. This shows that the health promotion model developed by researchers is more effective in increasing the knowledge, skills and attitudes of cadres in providing first aid to patients experiencing daily emergency condition. The results of this study are in line with the results of research that used educational programs based on this model and provided results in the form of improved knowledge and attitude in patients with chronic heart failure (Wang et al., 2017). Research that provides health promotion to hypertensive patients using educational programs based on this model also shows improvements in knowledge and attitude scores (Hosseini et al., 2014). Likewise, other research results state that the PRECEDE-PROCEED model can significantly increase in the respondents' knowledge, attitude, actions, family support, health worker supports, and cultural support (Fitriani et al., 2020). This study found an increase in community attitudes in providing assistance to victims of emergency situations. This confirms previous studies found that there was an increase in community confidence in accessing PSC-119 services after first aid training was carried out for victims with significant emergency conditions (Sunarto & Harnanto, 2021).

A systematic review of several research articles that applied this promotion model stated that interventions using the PRECEDE-PROCEED model significantly improved knowledge (Kim et al., 2022). Increasing knowledge, skills, and attitudes by providing the PRECEDE-PROCEED model can occur because this model provides the opportunity to apply theoretical frameworks, interventions, and evaluations in health promotion strategies (Green et al., 2005). Improvements in knowledge, skills and attitudes can also be supported by an increase in interest in participating in health promotion activities. A study that applied a similar model gave results that the health promotion application using the PRECEDE-PROCEED model gave positive results on interest, confidence, and willingness to participate in health promotion programs for populations in the community (Tapley & Patel, 2016). Precede-Proceed connect health promotion goals with public health objectives, providing an ethical guide for democratic and participatory health promotion (Porter, 2016).

The education provided in this research was carried out in the form of groups in the community. This can encourage increased motivation to take part in educational programs. Health education given in group discussion is an appropriate method to teach adults due to its communicative atmosphere (Sumitro et al., 2019). Health promotion given in group discussion can also increase interactions among group members (Cole et al., 2019). Group discussions can increase mutual understanding between group members so that they become an effective means of health education (Riyadi & Ferianto, 2021).

## **CONCLUSION**

This research shows that both groups show an increase in scores. The results of the difference test in all domains (knowledge, skills, attitudes) show Sig 0.00 so it can be concluded that there is a significant difference in the increase in scores between the treatment group and the control group. The conclusion of this research is that the Community-Based Daily Emergency First Aid Management Training Model increases

community competence in carrying out first aid for everyday emergency situations. This Model can be applied to develop training for the community in the future.

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## Original Research

# The Phenomenon of Sleeping in Sand Based On Culture In Elderly With Osteoarthritis

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**Background:** Pain in the elderly with osteoarthritis requires alternative therapy to fulfill their comfort. The purpose of this study was to explore the culture of sleeping on the sand among the coastal elderly with osteoarthritis pain.

**Methods:** This research method used a qualitative research approach with phenomenological research design and data collection techniques using in-depth interviews, participant observation, and documentation. The time of the research is from April to May 2023, located in Legung Village, Batang-Batang District, Sumenep Regency. The technique was judgment sampling, with nurses as key informants, the elderly as main informants, and traditional and community leaders as supporting informants, so the informants in this study were 18 participants. Data analysis uses thematic analysis based on values, activities, and artifacts.

**Results:** 1. Cultural elements in the form of values and ideas in the culture of sleeping on the sand include sleep history, belief in sleeping on the sand, and concepts or values in society. 2. The form of activity can be seen in several sand extraction activities or the implementation procedure of preparing sand to be used as the basic material for bedding. 3. The form of the artifacts is related to the tools and materials used in this case, which are related to sleep culture.

**Conclusion:** The culture of sleeping on the sand has a comforting effect on older people based on three forms of culture, including ideas and values, activities, and artifacts. The culture of sleeping on the sand can be used as a daily activity to overcome the problem of osteoarthritis in older people. This research can be developed regarding the implementation of culture-based transcultural nursing care.

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## INTRODUCTION

The elderly are a natural stage of human life that is often associated with a decrease in body functions such as joint pain (Syaifurrahman Hidayat et al., 2021). Pain in the elderly with osteoarthritis is generally chronic pain, and patients often seek alternative therapies to reduce pain (Soonger, 2005). A person who feels pain means that his comfort needs are not being met (Varndell et al., 2020).

Untreated pain can cause emotional distress and trigger disease recurrence, so nurses need to provide interventions to meet the comfort needs of the elderly in dealing with pain (Ali & Abdulkareem, 2020; S. Hidayat, 2014). The coastal elderly generally feel comfortable sleeping on the sand, and based on the results of the analysis studied through emic, sleeping on the sand can help provide comfort (Regnani, 2014), but there has been no previous research on the effect of the tradition of sleeping on the sand on the comfort and pain of osteoarthritis.

In general, osteoarthritis is pain that is often experienced by the elderly, especially in the joints (Bhattarai et al., 2020; Imagama et al., 2019). Regarding osteoarthritis pain, the elderly in coastal areas have their own uniqueness, based on data from the Sumenep District Health Office in 2020, showing that osteoarthritis is more common in the elderly in dryland areas than in coastal areas. This is possible because the elderly in coastal areas use sand in their daily lives. Days are like sleeping in the sand (Mulyadi & DIP, 2021).

The world's population is currently in the aging population era, where the number of people aged more than 60 years exceeds 7 percent, while in Indonesia, the percentage of the elderly from the total population is 9.92%, with 26.82 million elderly people. In 2045, Indonesia is projected to be in the aging phase of the population (BPS, 2020; Tadjoedin et al., 2017). According to BPS data, Susenas 2020 shows that the province of East Java has the third highest percentage of elderly people (13.38%), after the Special Region of Yogyakarta (14.71%) and Central Java (13.8%). Based on data on the elderly in East Java, it shows that East Java is an area with an aging population structure with as many as 62.09 young elderly people, 28.33 percent middle elderly people, and 9.59 old elderly people (BPS, 2020).

Based on the results of Riskesdas (2022), osteoarthritis in Indonesia is still a common non-communicable disease in the elderly. Osteoarthritis is a disease that ranks first among the elderly in Sumenep Regency with an incidence of 29.09%, while in Legung Village, Batang-Batang sub-district, it is also the highest non-communicable disease in the elderly at 27.29% (Sumenep Regency Office, 2020). These data indicate that osteoarthritis is a major problem among the elderly, especially at the Legung Health Center. The prevention method is carried out through a health promotion strategy approach in the form of joint pain health education so that there is a need for independent prevention and control efforts in the elderly in an effort to improve their health status.

One way to improve the health status of the elderly is through cultural schemes, cultural norms, and normative thinking that play an important role in treatment behavior and the use of complementary therapies (Osokpo & Riegel, 2021). Indonesia is one of the countries that still maintains its culture of maintaining public health. Efforts to maintain and develop culture require local strength to support national forces capable of bringing Indonesia's name to the international scene, but still with the noble values that

have been built by the community's ancestors (Syaifurrahman Hidayat et al., 2020, 2022).

The development of this local culture is one of the steps to support the cultural, health, economic, and socio-cultural development of the Indonesian nation (Sabri et al., 2019). In the field of health, nurses carrying out nursing care for the elderly need to pay attention to the culture of the client so that they can provide care and welfare for the elderly according to culture while meeting the basic needs of the elderly (Mirabelle, 2013; Sabri et al., 2019).

The culture that is still maintained and believed by the people of coastal areas in Legung Village, Batang-Batang District, Sumenep Regency is the tradition of sleeping on sand, which can improve the health status of the community. Sleeping on the sand is part of the culture of the Madurese coastal community, where, according to Regnani (2014), the tradition of sleeping on the sand is enjoyable, feels comfortable, and does not endanger health. Kim & Kim-Godwin, (2019) stated that the elderly's sleep activity was influenced by a culture-based expectation intervention.

Sleeping on a stretch of sand is believed to be beneficial for health by coastal communities and is used as a culture for the elderly. According to Regnani, warm conditions increase the elasticity of the collagen tissue due to the increased viscous flow of the matrix and collagen fibers. A warm environment promotes blood circulation and muscle relaxation, which reduces pain (Shehata & Fareed, 2013; Silvia et al., 2018).

On the northern coast of Batang-Batang Sumenep Syaifullah, (2012) states that the life of the elderly in Legung Village is identical to the habit of using sand, meaning that since ancient times until now, the community has considered sand to be a part of life. In the daily behaviors carried out by the elderly, such as resting, relaxing, grouping together, working, drying fish, giving birth, and sleeping in the sand, they assume that these behaviors give them a sense of fatigue and that body aches will disappear so that their bodies feel fresh (Regnani, 2014). According to (2011), nursing intervention for clients must pay attention to cultural values and sick health contexts, where everyone from each culture knows and can define ways according to their experiences and perceptions of the world of nursing and can connect experiences and their perceptions of healthy beliefs in general with their practice.

Based on the phenomena described in the background, the culture of sleeping on the sand is believed to reduce fatigue and pain, which has the potential to reduce the incidence of osteoarthritis in the elderly. So it needs to be proven in research so that it can be accepted as a condition of a knowledge concept, namely the culture of sleeping on the sand based on transcultural nursing in coastal elderly who experience osteoarthritis pain in increasing comfort. The purpose of this study is to explore the culture of sleeping on the sand among the coastal elderly with osteoarthritis pain.

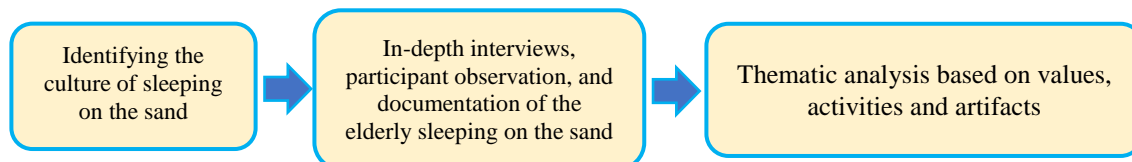
## **MATERIALS AND METHOD**

This research has received approval from the health research ethics committee of the Faculty of Nursing, Universitas Airlangga, through a statement that passed the ethical review "ethical approval" No. 2565-KEPK in June 2022. This research method used a qualitative research approach with a qualitative research approach. Phenomenological research design, whereas this research involves rigorous and thorough examination where the main concept is meaning, which is the essential content

of human conscious experience, is carried out in-depth to identify essential qualities (Moleong, 2014).

Data collection techniques used in-depth interviews, participant observations, and documentation about sleeping in the sand and the quality and benefits of sand in the culture of sleeping on sand passed down from generation to generation on the coast. old.

The qualitative research design is as follows:



**Figure 1.** Qualitative Research Design

The technique was purposeful sampling, also known as judgmental sampling, based on participant characteristics. The informants in this study were 18 participants, including nurses as key informants, the elderly as main informants, and traditional and community leaders as supporting informants. Here are the following informant criteria: 1) Elderly, as many as 9 participants aged 60–74 years, experiencing osteoarthritis based on data from the Legung Health Center and domiciled in Legung Village for more than 1 year. from 20 years, 2). There were 3 participants who were traditional figures, namely someone who has a traditional position and has lived in Legung Village for more than 20 years. There were 3 participating nurses, namely someone who has been in charge of providing nursing services in Legung Village for more than 10 years and has a minimum of formal nursing education Diploma III in Nursing Education 3). The community of 3 participants, who are individuals who live together in one place and interact with the elderly who sleep on the sand and have lived in Legung Village for more than 20 years, consisted of three forms of culture, including values and ideas, actions and activities, and objects and artifacts.

Data collection on phenomenological approaches used in-depth interviews with the help of interview guides, participant observation, and documentation. This instrument used interview guidance based on a qualitative approach focused on three forms of culture, namely values/ideas, actions/activities, and objects/artifacts. Qualitative approach analysis uses thematic analysis, which is a method to identify, analyze, and report patterns or themes based on data.

## RESULTS

The results of the study show that cultural elements in the form of values and ideas in the culture of sleeping on the sand include sleep history, belief in sleeping in the sand, and concepts or values in society.

*"I've been sleeping on the sand since I was little; when it comes to the specifics of the time aspect, I don't understand because this has been passed down from generation to generation." (IH2306MSY02)*

*"I've been sleeping on the sand since I was born. Yes, since I was little, I've slept on the sand. Therefore, I'm not comfortable sleeping on a mattress until now; even though I have a mattress, the mattress at home is used as jewelry instead" (NM0306LS01).*

The results of in-depth interviews with the elderly showed that the history of the emergence of sleep culture was not explained in detail; all informants stated that the

culture had existed since they were small, and their ancestral parents previously also did the same thing without knowing the exact reason, and it was carried out from generation to generation. Up to now and is the same as the statement made by the leaders, community, and nurses in the village that the habit of sleeping with sand has been around for a long time; even when they first lived in Legung village, there was already a culture of sleeping on the grounds of sand following the statement. That sleeping with sand has been around for a long time and feels comfortable sleeping on sand, which is done in daily activities.

*"I'm still more comfortable in the sand, sir because my body feels warm when I sleep in the sand; in the rainy season, it's even more comfortable to sleep in the sand, and part of my body goes into the sand" (AY1506LS02).*

*"When I sleep on the sand, my body feels comfortable with the warmth of the sand, and my body immediately merges with the sand; moving in the sand is also comfortable; I don't feel any limits; and if it hurts my whole body, sir, sleeping on the sand can reduce the pain" (TN1506LS03).*

According to the ethical view (outsiders' point of view), this culture causes the body to be dirty, not beneficial for health, and so on, which is different from an emic point of view. The emic approach in this case does offer something more objective because cultural behavior is studied and categorized according to the views of the people or informants themselves, where the results of interviews with informants say that sleeping on the sand provides many benefits by making you feel comfortable and sleeping faster. Sand with a warm body makes the body fresh after waking up. People's beliefs regarding the comfort of sleeping in the sand are also described in the results below:

*"So far, I have never had a ban from health workers, so it seems that there is no problem because I have never had any health problems when I sleep on the sand" (ST0207LS09).*

According to the results of in-depth interviews from the perspective of health workers and leaders, there are no rules forbidding sleeping in the sand, and most community leaders recommend sleeping in the sand because it is beneficial for the elderly, but for health workers, it is recommended not to sleep in the sand if there are infectious wounds in the elderly; they are worried that infection will occur. It's getting worse, even though there are still many elderly people who still sleep in the sand. For this reason, we humans come from the ground and are always in contact with the ground, so our daily activities, including sleeping, are always under the sand.

In this study, the cultural activity of sleeping on the sand can be seen in several activities. The first is the activity of taking sand or the implementation procedure of preparing sand, which will be used as the basic material for the bed.

*"The way to take the sand is the same; yes, take it on the beach, which is white. That's right, just take it with a small hole, and it's quite easy to pick it up because the color of the sand is the smoothest and the color is the whitest. How to clean it first in the area you want to pick up so that the dirt is not mixed, it is sifted using a sand sieve." (TN1506LS03)*

The results of the interview above show the implementation procedure for preparing sand, namely that the process of taking sand is determined by a distance between 100 - 150 m from the beach, cleaning the sand that has been collected by inviting or separating it from dirt, and sand that has been collected and is already clean

will be included. into sacks to be moved home; the sand that is ready in the sack will be transported and brought to their respective homes. In the process of transporting, according to the informant, if you have your means of transportation.

The results of the research are in the form of the second sand-based sleeping culture activity, namely sleeping activities that are usually carried out by informants.

*"If I usually sleep on my back, sir, but when I have a good night's sleep, there is no limit if I sleep at night above 10 p.m. and wake up at 4 a.m. all ready to cook and go to the market." (AR1806LS06)*

*"If you change your sleeping position, sir, yes, if you sleep on your stomach, your head still has a pillow; if you sleep for about 6-7 hours at night, sir." (MD3006LS07)*

The results of the interview can be obtained, indicating that the informant's bedtime does not have a specific time or certain hour, namely sleep time according to sleep needs with a duration of about 6-7 hours a day, and the sleeping position is not determined with certainty; there are no standard rules stating the sleeping position on the sand. The most comfortable position is with your feet buried in sand; this is believed to provide comfort and warmth and reduce the pain you feel. The shape of the artifact is related to the shape of the sand-bed mattress, and the tools and materials used in this regard are related to sleep habits.

*"White sand, sir, only like this if the one in the room is smoother, sir, and not dusty, sir, because when we sleep on the sand we don't sneeze; even though the sand is fine, it doesn't fly, so it doesn't interfere with breathing." (AR1806LS06)*

*"The shape of the mattress is the same, sir, a box like this, about 25 cm thick; the better, the thicker, the better to sleep on." (SY0207LS08)*

*"Sand cleaning tools, namely broomsticks, sieves, trash cans, and small spoons, sand cleaning tools." (LS-02/16/VII/2022)*

The results of observations and interviews showed that the tools and materials used to prepare were hoes, plates or sieves, sieves or sieves, broomsticks, transportation equipment, sacks, and pillows. While the other equipment used is a bed, in general, this is a room of a certain size. Most of them are 3x3m or 3x4m. The sand is placed about 20–30 cm; this size is ideal and provides comfort while sleeping.

*It's more comfortable, the ceramic one, sir, of course... it's still possible, sir, just what needs to be modified by giving a carpet or body cleaner, sir... yes, sir, if you add it, it's better so that after waking up you can clean it immediately." (AY1506LS02)*

Maintaining local culture by paying attention to ways or negotiating with local culture, in this case the culture of sleeping in the sand, can be modified on the artifact aspect, namely the design of a sand-based mattress that aims to add comfort to the elderly, including by adding artifacts in the form of carpets and body cleaning towels, as well as the design and bed mattress.

## **DISCUSSION**

According to informants, there are various beliefs about the benefits of sleeping on the sand. Sleeping in the sand has more benefits, but the main thing is that they feel comfortable when they sleep in the sand. Most of the informants stated that sleeping on the sand provides a sense of comfort and warmth to the body and can reduce rheumatic pain in the joints. joints, and while feeling sleepless in the sand can make you fall asleep faster, this is a cultural adaptation that has occurred since time immemorial, where cultural adaptation is effective in promoting many health behaviors and increasing

health disparities in various health conditions (Choi et al., 2019). The local value of the Legung Village community is a high sense of trust and obedience to their ancestral heritage. This form of culture lies in the minds of citizens (Koentjaraningrat, 2011).

From the perspective of the community as cultural actors and from the perspective of health workers, in principle, health workers do not prohibit or encourage the culture. What needs to be considered is that when an injury occurs, it is better not to sleep on the sand because it can cause infection. Meanwhile, from the community perspective, there is an interesting thing, namely the existence of a religious concept that states that humans come from the land and will return to the land (die), so it is better for the community to interact with the land. Community support is very effective, including satisfying relationships with spiritual and environmental aspects (McConatha et al., 2020).

Cultural norms and practices can be used to interpret and manage illness, the cultural connotations of health behaviors, and the structural challenges that affect self-care (Henry Osokpo et al., 2021). In addition, cultural differences have had an impact on the adaptation and professional experience of internationally educated nurses (Balante et al., 2021). The level of self-efficacy in nursing culture has a consequent capacity to provide culturally competent nursing care (Herrero-Hahn et al., 2019).

The cultural action or activity of sleeping on the sand is shown through the maintenance of the sand-bed mattress that is used for the daily needs of the elderly and has an impact on healthy living behavior, namely feeling comfortable and warm, thereby reducing pain. During sleep, many adrenaline hormones are released in waves in the bloodstream, which will have a refreshing effect, stimulate body growth, stimulate tissue formation, accelerate healing, help the metabolic process, and maintain health and endurance, which in turn will have an impact on the body an increase in the elderly's energy both physically and psychologically (Arendt, 2006; Hines & Marschall, 2017).

The activity of sleeping on the sand for the elderly in Legung Village in a supine position, right side and left side without limitation of movement, is the potential point of the body touching the sand by submerging part of the lower extremities into the sand, whose sleep duration is between 6-7 hours (short sleep) per day (Štefan et al., 2018). Provides a physiological effect of dry warm therapy; this therapy works to increase molecular (cell) activity with the method of energy flow through conduction (flow through a solid medium), namely on a sand-bed mattress. The therapeutic effects of warm/heat therapy on sand include increasing the elasticity of collagen tissue, reducing joint stiffness, reducing pain, reducing muscle tension, reducing edema and swelling in the chronic phase, and increasing blood flow (Arovah, 2010). Warming can work by increasing circulation and muscle relaxation, thereby reducing pain (Shehata & Fareed, 2013).

The characteristics of white sand, soft, dense, and warm, with sleeping conditions on the elderly body always supporting or holding the joints, will provide strong tension on the skin, as is the case with Kinesio taping therapy and knee braces (Cudejko et al., 2019; Haris & Beng Chye Tan, 2021). Can be beneficial for muscle contraction, assist muscles in carrying out their functions, stimulate mechanoreceptors in the skin, and increase proprioceptive feedback so as to produce the correct body position. This is a very basic thing to do to restore the function of the extremities, resulting in a fresh body condition after waking up from sleep (Guilherme, 2013; Lu et al., 2018; Melese et al.,



2020). The American Academy of Orthopaedic Surgeons, (2021) states that there is moderate-strength clinical evidence that the use of braces can improve function, pain, and quality of life in OA patients. The support can also provide a subjective feeling of normality in the tibiofemoral joint, thereby reducing excessive stress on the joint.

The results of the Geology Center Laboratory Test based on the petrography description test and X-ray diffraction (X-RD) stated that loose sand in Legung Village has a very fine size (<0.1 mm–0.4 mm), good sorting, and a very angular to rounded responsibility (angular–subrounded). The composition of the sand consists of quartz, calcite, k-feldspar (potassium feldspar), hematite, and clay minerals. The mineral calcite is found in the form of carbonate skeletal fragments. The composition of quartz in the sand of Legung Village is 57%, where the quartz sand, known as white sand, is the result of the weathering of sedimentary rocks, which contain a lot of main minerals, namely silica and feldspar minerals. Quartz sand from the weathering process is washed by water and carried by the wind, which is then deposited on the seashore (Sukandarrumidi, 2018).

Sand is one of the materials in the form of porous grains that have the potential to be used as a medium that can conduct heat (Nirwana et al., 2017). The physical properties of quartz sand are clear white or other colors depending on the content of the impurity compounds; for example, red contains Cu oxide and yellow contains Fe oxide; the hardness of quartz sand is 7 (Mohs scale) and heat conductivity is 12-100°C, quartz sand is found with a purity that is high varies depending on the formation process in addition to the presence of other materials that participated during the deposition process, quartz sand is found with varying grain sizes in wide distribution, ranging from a fine fraction of 0.06 mm to a coarse size of 2 mm (Wicaksono, 2009).

The results of in-depth interviews with elderly informants and leaders show that in carrying out the treatment of artifacts, they use homemade tools to make the sand clean and not dirty, such as a sifter or sieve (pangajegen) to make the sand suitable for their bedding. Sifting is the separation of various mixtures of solid particles that have various sizes of materials using a sieve. The sieving process is also used as a cleaning tool and a contaminant separator. Sifting makes it easier for us to get sand with a uniform size; the sieving method in this method is used by moving horizontally (horizontally) on the sieve surface (Zulfikar, 2010).

## **CONCLUSION**

The culture of sleeping on the sand must be nurtured and preserved, including the maintenance and preservation of a culture that has been proven to continue to support a culture that will be passed on to descendants. Based on the need to enjoy the benefits of sand beds as part of the treatment of elderly people with osteoarthritis, modifications to the culture of sleeping on sand beds can be realized in the form of standardized sand bed-shaped artifacts. The activity of sleeping on the sand for older people in Legung Village is in a supine position, tilted right and tilted left without limitation of motion, the potential point of the body touching the sand, which will provide a physiological effect of dry, warm therapy. This therapy increases molecular (cell) activity with the energy flow method through conduction (flow through a solid medium).

The weakness of this research is that the scope of the research is too small and needs to be expanded to cover all the sand on Madura Island. To better understand culture, methods for ethnographic research have been developed.

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## Original Research

# The Effectiveness of Role Play on Knowledge and Skills of Spinal Injury Indications Evacuation Improvement

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### ABSTRACT

**Background:** Spinal injuries are paralysis-causing injuries caused by trauma or disease processes. Members of the Youth Red Cross still have limited knowledge and abilities when it comes to evacuating signs of spinal cord injury. When it comes to performing first aid, knowledge and abilities are crucial. The role-playing approach is one of the methods used to improve knowledge and abilities. The research aimed to find out the effectiveness of role plays in developing knowledge and evacuation skills of spinal cord injury signs in SMAN 1 Ngemplak Youth Red Cross members.

**Methods:** This study used a quasi-experimental design with a control group and a pretest-posttest design. Purposive sampling was employed using a sample of 40 respondents who were divided into two groups: 20 respondents in the control group and 20 respondents in the intervention group. A questionnaire and an observation sheet were utilized as part of the research instrument. On the knowledge variable, the independent t-test was utilized, and on the skill variable, the Mann-Whitney test was used.

**Results:** Between the control and intervention groups, there were substantial differences in knowledge and skill factors. This is demonstrated by a significance value of 0.01 in the knowledge variable and a significance value of 0.023 in the skills variable.

**Conclusion:** For Youth Red Cross SMAN 1 members, role play was effective in developing knowledge and skills of the evacuation of spinal cord injury indicators.

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## INTRODUCTION

Spinal cord injury (SCI) is damage to the nerve bundle and fibers extending from the lower part of the brain down through the lower back (NINDS, 2023). The overall injury prevalence rate in Central Java at school age is 13.71%, while the prevalence rate

for spinal injuries that occur during activities at school is 3.07%. Meanwhile, the prevalence of spinal injuries occurring at school age in Boyolali Regency is 6.61% (Kemenkes RI, 2018).

Spinal cord injury is a condition where a person experiences physical changes so that, in carrying out their activities, they need the help of other people as they experience paralysis. The more severely a person experiences a spinal fracture, the greater the effects of dysfunction that person will experience (Swannjo & Suyasa, 2020). Factors that cause spinal cord injuries include traffic accidents, falls, and sports-related injuries, with the order of locations most affected being the cervical, thoracic, lumbar, and least sacral areas (Munawarah et al., 2019; Sudadi & Zaki, 2018).

Based on age, injuries that occur at school are influenced by several factors. In male students, it was found that the causes of serious injuries were broken bones due to falling down the school stairs, burns, and lacerations while participating in sports at school. Meanwhile, the types of serious injuries experienced by female students are more often caused by tailbone fractures due to falls, bruises, and lacerations related to sports (Usman et al., 2021).

First aid is the first action at the scene of an accident or disaster before receiving further treatment at the hospital. The objective of this action is to speed up recovery for victims, prevent disability, and increase life expectancy. First aid efforts for survivors with spinal injuries are using the log roll evacuation technique (Kase et al., 2018). The log roll technique is an evacuation technique that is carried out by tilting the client's body and maintaining it in a straight, parallel position at all times using flat media such as a wooden board or long spinal board.

This technique requires 2–5 people (Rifai & Ilyas, 2019). In the school setting, the authority to provide first aid rests with the members of the Youth Red Cross. Unfortunately, in the initial interview, it was found that even though they had received previous training, this was not balanced with ongoing training and a lack of experience providing direct first aid, which resulted in their knowledge and skills being less than optimal.

Role play is a learning method involving respondents in learning together so that it can increase respondents' creativity and expression in expressing their imagination without movement limitations. With role-playing, the learning atmosphere becomes more lively. This method is practiced directly with respondents (Nurhasanah et al., 2016).

Research related to the use of this method in first-aid training is quite common. However, the use of this method in specific first-aid training for suspected spinal cord injury patients in school settings is quite rare. Therefore, this research aimed to identify whether the roleplay method was effective in increasing the knowledge and skills of evacuating patients with indications of spinal cord injury among the Youth Red Cross members.

## **MATERIALS AND METHOD**

### **Study Design, Sample, and Settings**

This research conducted a quasi-experimental design with a pretest-posttest with a control group design on 40 members of the Youth Red Cross at Ngemplak 1 State High School in Boyolali as respondents. The selection of respondents was carried out using a purposive sampling technique involving only tenth and eleventh-grade teenage Red



Cross members who were willing to be respondents and completed the. Respondents were divided equally into the experimental group and the control group.

### **Instrument**

The level of knowledge regarding the evacuation of patients with indications of spinal cord injury was assessed using a knowledge questionnaire. The questionnaire consists of 20 questions created by researchers, in the form of multiple choices with "right" and "wrong" answer options. The validity test of the knowledge questionnaire showed that the results of this questionnaire were valid, with a  $r_{\text{count}}$  of 0.432-0.750 ( $> r_{\text{table}}$  0.432).

This questionnaire has also been proven reliable, with a Cronbach's alpha value of 0.669. First aid skills are measured using an observation sheet made based on standard operating procedures. The observation sheet contains the respondent's personal data and standard operational procedures for evacuating log rolls. The observation sheet is filled in by marking a checklist (P) in the column with a value of 2 if the action is carried out correctly, a value of 1 if the action is carried out but not quite right, and a value of 0 if the action is not carried out.

### **Data Collection**

Data collection was carried out after an ethical test letter was issued from the Health Research Ethics Committee of Dr. Moewardi Hospital, Surakarta. All respondents were given an explanation about the course of the research as well as their rights and obligations while participating in the research, then asked to sign informed consent as proof of their willingness to become respondents. Observation methods, interviews, and questionnaires are data collection methods used by researchers.

Observations were used to observe geographical problems in Ngemplak District; interviews were conducted with the Youth Red Cross supervisors at Ngemplak 1 High School to identify the learning methods applied during the Youth Red Cross activities; and questionnaires were distributed to the Youth Red Cross members to determine the respondents' knowledge when encountering incidents of survivors with indications of spinal cord injury. The experimental group received training using the roleplay method, while the control group received training using the conventional method.

### **Statistical Analysis**

Research data was processed using the SPSS 25 program. Univariate analysis uses respondent characteristic variables such as gender, age, and length of participation in the Youth Red Cross. This also explains the pre-test and post-test scores on the knowledge and skills variables. Bivariate analysis is used to test the hypothesis. For the test of the difference between two paired means, the data in the experimental group used the dependent t-test because it was normally distributed, while in the control group, the Wilcoxon test was used because the data was not normally distributed. Test the difference between two unpaired means on the level of knowledge using the independent t-test and on skills using the Man-Whitney test.

## **RESULTS**

The univariate analysis results describe the frequency distribution based on age, gender, and length of participation. According to their age, the majority of respondents are 16 years old, both in the experimental group (50%) and the control group (60%). All of the respondents in the experimental groups were female (100%), while in the control

group, 95% of respondents were also female. According to their duration as an organization member, the majority of respondents in the experimental group (60%) have been members for 19 months, while in the control group, 65% of respondents have been members for 7 months (table 1).

**Table 1.** Respondents Characteristic

Characteristics	Frequency (%)		
	Experimental group (n=20)	Control Group (n=20)	
Age	15 yo	5 (25%)	2 (10%)
	16 yo	10 (50%)	12 (60%)
	17 yo	5 (25%)	6 (30%)
Gender	Male	0 (0%)	1 (5%)
	Female	20 (100%)	19 (95%)
Duration of Participation	7 monts	8 (40%)	13 (65%)
	19 months	12 (60%)	7 (35%)

The results of the univariate analysis also present data on changes in the level of knowledge and skills in the experimental and control groups (Table 2).

**Table 2.** Pre and Post Level of Knowledge and Skill

Characteristics	Frequency (%)				
	Experimental group (n=20)		Control Group (n=20)		
	Pre	Post	Pre	Post	
Knowledge Level	Good	7 (35%)	19 (95%)	9 (45%)	14 (70%)
	Fair	13 (65%)	1 (5%)	10 (50%)	5 (25%)
	Poor	0 (0%)	0 (0%)	1 (5%)	1 (5%)
Skill Level	Good	8 (40%)	16 (80%)	0 (0%)	12 (60%)
	Fair	8 (40%)	4 (20%)	4 (20%)	8 (40%)
	Poor	4 (20%)	0 (0%)	16 (80%)	0 (0%)

The level of knowledge in the experimental group before the intervention was carried out showed that 7 (35%) respondents were in a good category, 13 (65%) were fair, and 0 (0%) were poor. After the intervention, knowledge in the control group increased, with 19 (95%) respondents in the good category, 1 (5%) in the fair category, and 0 (0%) in the poor category. Meanwhile, in the control group, before the intervention, respondents in the good knowledge category were 9 (45%), 10 (50%) were fair, and 1 (5%) were poor.

After the intervention was carried out, the knowledge of respondents in the control group increased, with 14 (70%) in the good category, 5 (25%) in the fair category, and 1 (5%) in the poor category. Evacuation skills indicative of spinal cord injury in the experimental group before intervention were categorized as good at 8 (40%), fair at 8 (40%), and poor at 4 (20%). After the intervention was carried out, the skills of respondents in the experimental group increased, namely 16 (80%) in the good category, 4 (20%) in the fair category, and 0 (0%) in the poor category.

Meanwhile, in the control group, evacuation skills before the intervention were carried out in the fair category 4 (20%) and 16 (80%) were in the fair category. After the

intervention, the skills of respondents in the control group increased, namely 12 (60%) in the good category, 8 (40%) in the fair category, and 0 (0%) in the poor category (Table 2). The result of the analysis of pre- and post-intervention knowledge and skill level changes is presented in Table 3.

**Table 3.** Comparison of Knowledge and Skill Levels of the Experimental Group and the Control Group

Characteristic		N	Mean	Pvalue
Knowledge Level	Experimental Group	20	2,95	0,010
	Control Group	20	1,25	
Skill Level	Experimental Group	20	24,5	0,023
	Control Group	20	16,5	

The results of the analysis of the comparison of knowledge show that the mean in the experimental group (2,95) is higher than in the control group (1,25), with  $p_{\text{value}}$  of 0,010 ( $<0.05$ ). The f skill level in the experience group (24,5) is also higher than in the control group (16,5), with a  $p_{\text{value}}$  of 0,023 ( $<0.05$ ). These results indicate that the intervention given to the experimental group is significantly effective in increasing the respondents' knowledge and skills in providing evacuation to patients with suspected spinal cord injuries (Table 3).

## DISCUSSION

Based on gender characteristics, it was found that the majority of research was conducted by female respondents. These results are in line with research conducted by Ayu et al., (2019) that explained differences in motivation for participating in an activity. This occurs because female students have greater motivation or desire than male students because there are differences in behavior between women and men. Female students tend to spend more time on structured activities, while male students spend more time outdoors for unstructured activities.

The distribution of respondents' age characteristics shows that in both the intervention and control groups, the majority of respondents were 16 years old. The results of this research show that all respondents are in the middle adolescent age category. Adolescence is a transition period from childhood to adulthood that is marked by psychological and biological growth and development (Hidayati, 2016).

The teenage age categories, according to Fatmawaty (2017), are early adolescence (12–15 years), middle adolescence (15–18 years), and late adolescence (18–21 years). In research conducted by Maulida & Pranajaya (2018), during adolescence, there are brain changes so that they are able to think more critically and their thinking patterns improve, and this happens to high school students. The more mature a person's age in thinking will continue to influence a person's cognitive level, grasping power, and thought patterns (Widyaswara & Suwaryo, 2017).

Based on the length of participation of respondents, the data showed that the majority of respondents in the control group were members who took part in the Young Red Cross for 7 months, while in the intervention group, the majority were members who took part in the Young Red Cross for 19 months. The Young Red Cross members of Ngemplak 1 High School are active in participating in research activities so that it is easier to understand and practice evacuation for indications of spinal cord injury. This is proven by the results of the increase in knowledge and skills of the Young Red Cross

members after being given the intervention. These results are in line with Nofianti (2018), who stated that students who actively participate in school extracurricular activities can increase their knowledge, so indirectly, their learning achievement will also increase.

The results of this research are in line with the objectives of extracurricular activities in schools. According to Kemendikbud (2014), extracurricular activities are carried out to develop students' talents, potential, interests, cooperation, independence, abilities, and personalities to support the achievement of the goals of national education. With this goal, students can increase their enthusiasm for improving their learning achievement optimally so that it is in accordance with the goals of national education.

Based on the research results, the average value of knowledge in the control group before and after the implementation had increased; however, the increase experienced was not as large as the average increase in the intervention group. The demonstration method is a learning method that shows a particular process and situation and has advantages, including students being active in observing the learning process, being able to understand the material being presented, and the delivery being clear and concrete (Aulia et al., 2019). In line with research conducted by Robani (2020), the average knowledge value obtained before and after the demonstration was increased; however, the increase in knowledge obtained was lower than the average value in the intervention group.

The average knowledge results in the intervention group before and after the majority of the intervention increased. According to Notoatmodjo (2014), the learning process is a change in abilities experienced by someone who wants to learn and is influenced by appropriate learning methods, tools, and techniques. Knowledge can arise due to the influence of the senses of sight and hearing through the media or methods used in the process of conveying information, which can have an influence on increasing knowledge. Knowledge is the result of curiosity about a particular object through sensory processes in the senses of sight and hearing.

The role-play method can support learning with cognitive, affective, and skill objectives. Increased knowledge can be seen from the pre-test and post-test scores (Suharini & Baharsyah, 2020). Research conducted by Tauhid et al., (2021) shows that before and after being given intervention, the average student ability score increased to 27.3%. The results of the average knowledge scores in both groups prove that there is an increase in knowledge among the Young Red Cross members of Ngemplak 1 High School before and after being given intervention in the form of role-play and demonstration methods. However, a higher increase occurred in the intervention group that had been given the role-play method; namely, there were 19 respondents who had good knowledge.

Before and after the intervention, there was also an increase in the average skill score in the control group. Demonstration is a method that uses teaching aids that aim to facilitate the learning process, and each student uses all the senses to receive the material that has been presented, so this method can improve students' skills. The results of research conducted by Rachmawati (2021), show that the group that was given the demonstration experienced an average increase in skill scores. The intervention group also experienced an increase in the average skill score.

According to Kundre & Mulyadi (2018), skills are a person's ability to apply theoretical knowledge in certain situations and do it well. Role play can encourage students to reflect on the knowledge they have so that it has an effect on improving

students' skills (Gamanik et al., 2019). In line with research conducted by Saputra et al., (2019) the results showed that all respondents in the treatment group at the pre-test were not yet able to take action to treat wounds, but after being given the role-play method, the post-test results showed that the majority of children were able to handle open wounds namely, 17 children (68%).

Another study conducted by J et al., (2020) showed that the total skill score before being given the role-play method was 38.66 and increased to 90.54 after being given the role-play method. The results of the average skill scores in both groups prove that there has been an increase in skills among the Young Red Cross members of Ngemplak 1 High School before and after being given intervention in the form of role-play and demonstration methods. However, a higher increase occurred in the intervention group that had been given the role-play method, where there were 18 respondents who had good skills.

In this study, the paired difference test on the control group's knowledge variable used the Wilcoxon test. The results of the Wilcoxon test show that there is a significant difference between knowledge before and after being given the demonstration. In line with research conducted by Prasetyawan and Fitri (2019), using the paired difference test, it was found that the demonstration method was effective in increasing students' knowledge of providing first aid.

The results of the paired difference test in this study used the dependent t-test on the intervention group's knowledge variable, namely that there was a significant difference between knowledge before and after being given the role play. In line with research conducted by Tauhid et al., (2021) the research results show that the role-play method has an effect on students' ability to provide first aid in earthquake disasters. The results of the research analysis conducted by J et al., (2020) show that there is a significant difference between respondents' knowledge before and after being given the role-play method.

The unpaired difference test in these two groups used the independent t-test with results of  $0.01 < 0.05$ , which means that role play is effective in increasing knowledge of carrying out evacuations for indications of spinal injuries. Even though both methods are equally effective in increasing knowledge, judging from the mean value, the mean value of role-play is higher than that of demonstration, namely 2.95 compared to 1.25. In line with research conducted by Aghababaeian et al., (2013) the results of the role-playing method showed a significant difference in the knowledge of the medical staff.

In line with research conducted by Suharini & Baharsyah (2020), the role-playing method using a disaster education pocketbook as a medium is more effective than the control group. Research conducted by Khoiro et al., (2021) also concluded that there are differences between role-playing and demonstration learning methods in the learning outcomes of class V students at MI Al-Hidayah Sidoarjo. A learning process is said to be successful if the selection of methods and media is carried out appropriately and effectively (Robani, 2020).

Using appropriate methods and media can improve students' competencies and skills in accordance with the targets to be achieved. The method is that learning method must attract students' attention so that an active, conducive, and enjoyable learning atmosphere is created so that students can develop their abilities (Negara, 2021). The results of other research conducted by Sukanto and Rifqia (2019), can conclude that role play is effective in increasing knowledge.

In this study, both interventions had an effect on increasing knowledge of evacuation for indications of spinal cord injury; however, the mean score for role play was higher than demonstration. The efforts made by researchers using the role-play method are because role-plays are considered more effective than demonstrations. The role-play method is a method whose implementation is able to present the role of an event in daily life that is brought out deliberately in a particular activity (Rahmawati & Puspasari, 2020).

The advantages of role play include students being able to think creatively and actively, being able to identify a particular situation, and giving students the opportunity to connect theory and practice through role-playing (Bahtiar & Suryarini 2019). The role-play method involves students taking part in role-playing so that it can increase collaboration between students and make learning effective. By implementing role-playing learning, students can increase their knowledge, so it is hoped that the Young Red Cross members will be able to know the correct first aid techniques for evacuating indications of spinal cord injury.

In this study, the paired difference test on the control group skill variable used the Wilcoxon test. The result is that  $H_0$  is accepted, which means there is a significant difference between skills before and after being given a demonstration. Research conducted by Rachmawati (2021), used the dependent t-test, namely that there was a significant difference in the skills of SMK 3 Blitar students before and after being given the demonstration method. The results of this research's pairwise difference test using the Wilcoxon test on the skill variable of the intervention group showed that there was a significant difference between skills before and after being given role play.

In line with research conducted by Saputra et al., (2019) using the Wilcoxon sign rank test, it can be concluded that there is a significant difference in skill actions before and after being given the role-play method. The results of the research analysis conducted by J et al., (2020) with the results of the research conducted, namely that there was a significant difference between the respondents' skills before and after being given the role-play method. In line with research conducted by Alimohammadi et al., (2017) research results show that there are differences in students' skills in carrying out basic life support using the role-play method.

The unpaired difference test in these two groups used the Man Whitney test with results of  $0.023 < 0.05$ , which means  $H_0$  is accepted, so it can be concluded that role play is effective in improving skills in evacuating indications of spinal injuries. Even though both methods are equally effective in improving skills, judging from the mean value, the mean value of role-play is higher than demonstration (24.5 compared to 16.5). In line with research conducted by Saputra et al., (2019) with the results of the Mann-Whitney test, there were significant differences in actions between the treatment group and the control group.

In this study, both interventions had an effect on increasing evacuation skills for indications of spinal cord injury; however, the mean score for role play was higher than demonstration. The use of two different methods in conducting research can influence differences in improving respondents' skills (Aulia et al., 2019). The demonstration method has the advantage that students' attention is more focused and directed on the material being presented (Noftalina, 2020).

According to Prasetyawan & Fitri (2019), the weakness of the demonstration method is that the longer the learning process takes, the less attention the presenter will have, so students feel bored. An effective learning method for preventing boredom is

role play. This is in line with learning principles, which prioritize emotional and intellectual processes, so that learning situations must be created to be happy, informal, and enjoyable (Aulia et al., 2019). Increased skills are influenced by choosing the right learning method.

According to Dorri et al., (2019) role play is an effective educational method in triggering active learning because all students have the opportunity to be involved, so it can increase students' self-confidence and make them think more creatively. Role play is an active learning method that can store skills in long-term memory. The role-play method has a positive impact, especially in increasing skill aspects. In line with research conducted by Delnavaz et al., (2018) the results show that the role-play method is effective in increasing the value of skills in carrying out triage.

The role-play method not only provides students with the opportunity to improve clinical skills but can also improve communication skills. Role play can improve students' communication skills because it aims to discuss and realize the competencies they have (Ahmady et al., 2021). According to Heidarzadeh et al., (2020) the role-play method can raise a student's motivation and satisfaction in the learning process. The advantages of this method include a combination of theory and practice, minimal facilities, and lower costs compared to other simulation methods.

The role-play method is very appropriate to apply to learning in the domains of attitudes and skills. Therefore, this method is suitable for learning because it can improve students' knowledge, attitudes, and skills widely. In line with what was stated by Souza et al., (2021) in the learning process, students will study three learning domains, including cognitive, which consists of intellectual development, knowledge, attitudes, and skills. Next, psychomotor is related to specific physical and affective abilities, which consist of emotional development including attitudes, behavior, responsibility, emotions, and respect. Moreover, emergency training can also increase the self-confidence of the community in accessing medical emergency services (Sunarto & Harnanto, 2021).

Research conducted by Vizeshfa (2016), shows that role-playing is a learning method that prioritizes collaboration so that it can improve student learning. The role-play method of learning can be used as a separate learning method or as a complementary method. This method has been accepted in academic education, which aims to prepare students to face a professional environment. This is in line with what was stated by Valizadeh et al., (2020).

The role-play method provides a great opportunity for students to develop their abilities in a safe and free environment and prepares them to prepare themselves for actual clinical practice. Role-play learning is a holistic form of learning that fosters critical thinking processes, moral values, and factual information. The approach used is the role-play method, namely, where interpersonal interactions are observed, analyzed, and evaluated by other people (Kiran & Stirling, 2020).

According to Ahmady et al., (2021) role play is a learning method that allows students to play roles in situations that are close to reality. The role-play method can guide students in understanding social behavior so that they can develop empathy in social environments. Therefore, by implementing role-play learning, it is hoped that it can improve students' skills so that the Young Red Cross members can carry out first aid techniques for evacuating indications of spinal cord injury correctly and quickly.

## CONCLUSION

The results of this study prove that the roleplay method is an effective method of choice for increasing knowledge and evacuation skills in patients with indications of spinal cord injury. However, in carrying out this research, there are still limitations, such as data collection, which was only carried out once. The level of knowledge and skills is something that must be continuously updated and evaluated regularly because there are many factors that influence its permanence. Therefore, in future research, it is hoped that periodic evaluations of the level of knowledge and skills can be carried out.

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