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Jurnal Keperawatan Soedirman

Jurnal terbitan berkala dikelola oleh Jurusan Keperawatan Fakultas Ilmu-Ilmu Kesehatan Universitas Jenderal Soedirman

- GENDER, REGION, AND BACKGROUND-RELATED FACTORS INFLUENCING ADOLESCENT DISEASE-PREVENTION BEHAVIOR DURING THE COVID-19 PANDEMIC IN INDONESIA
- THE RELATIONSHIP BETWEEN COVID-19 PREVENTION MEASURES AND QUALITY OF LIFE FOR THE ELDERLY WITH HYPERTENSION DURING THE COVID-19 PANDEMIC
- THE USE OF A SCORECARD TO EVALUATE THE PUBLIC'S COMPREHENSION OF COVID-19: A PILOT STUDY
- THE RELATIONSHIP BETWEEN PERCEIVED WORKLOAD AND ORGANIZATIONAL JUSTICE TOWARD NURSES' INTENTION TO LEAVE THEIR PROFESSION
- NURSES' EXPERIENCE OF ETHICAL DILEMMA AT THE END-OF-LIFE CARE IN THE INTENSIVE CARE UNIT
- THE RELATIONSHIP BETWEEN PSYCHOLOGICAL STRESS WITH BREASTFEEDING FREQUENCY AND BREASTMILK VOLUME DURING THE COVID-19 PANDEMIC
- THE PERSPECTIVES OF NURSES AND HIV-POSITIVE WOMEN ON A SELECTED MODEL OF PREGNANCY DECISION-MAKING PROCESSES IN NORTHEAST THAILAND
- THE RELATIONSHIP BETWEEN WAIST CIRCUMFERENCE AND WAIST-TO-HIP RATIO WITH RISK OF CARDIOVASCULAR DISEASE IN INDONESIA

Jurnal Keperawatan Soedirman

A scientific journal

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Conclusions from the results of research conducted delivered briefly and clearly

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or

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or

In 1990, Smith's study of primary school children ...

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The first citation: Masserton, Slonowski, and Slowinski (1989) state that ...

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Some references in a sentence

Several studies (Jones & Powell, 1993; Peterson, 1995, 1998; Smith, 1990) suggest that ...

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Book chapter:

Bergquist, J. M. (1992). German Americans. In J. D. Buenker & L. A. Ratner (Eds.), *Multiculturalism in the United States: A comparative guide to acculturation and ethnicity* (pp. 53-76). New York, NY: Greenwood.

Journal with DOI:

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Journal without DOI (DOI not available):

Hermawan, D., Yatim, I. M., Ab Rahim, K., Sanagi, M. M., Ibrahim, W. A. W., & Aboul-Enein, H. Y. (2013). Comparison of HPLC and MEEKC for Miconazole Nitrate Determination in Pharmaceutical Formulation. *Chromatographia, 76*(21-22), 1527-1536.

Hamfi, A. G. (1981). The funny nature of dogs. *E-journal of Applied Psychology*, 2(2), 38 - 48. Retrieved from http://ojs.lib.swin.edu.au/index.php/fdo

Conference

Zusfahair, Ningsih, D. R., & Kartika, D. (2015). *The potency of Amylase Producing Bacteria in the Liquid Waste of Tapioca Factory*. Paper presented at the 1st Pharmacy International Conference, Purwokerto, Indonesia.

Online Newspaper:

Becker, E. (2001, August 27). Prairie farmers reap conservation's rewards. *The New York Times*. Retrieved from http://www.nytimes.com

Encyclopedia:

Brislin, R. W. (1984). Cross-cultural psychology. In R. J. Corsini (Ed.), *Encyclopedia of psychology* (Vol. 1, pp. 319-327). New York, NY: Wiley.

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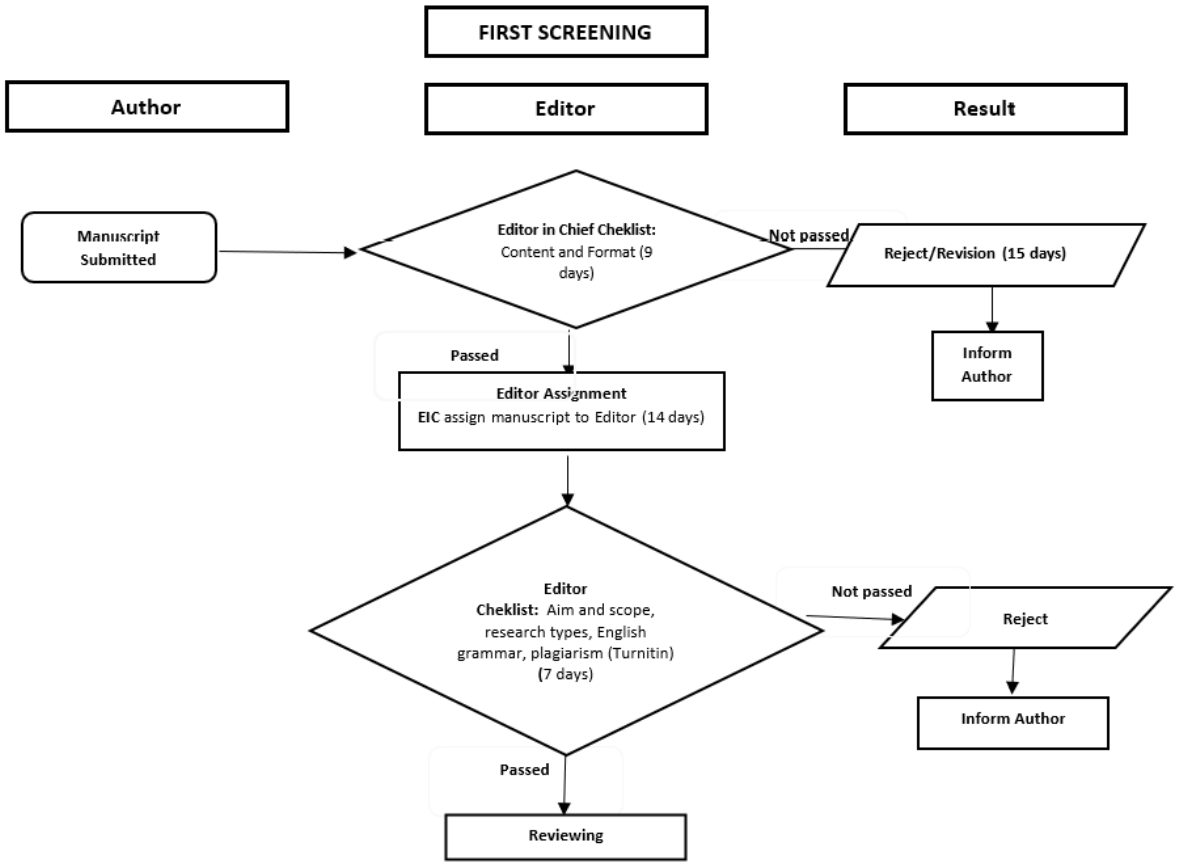
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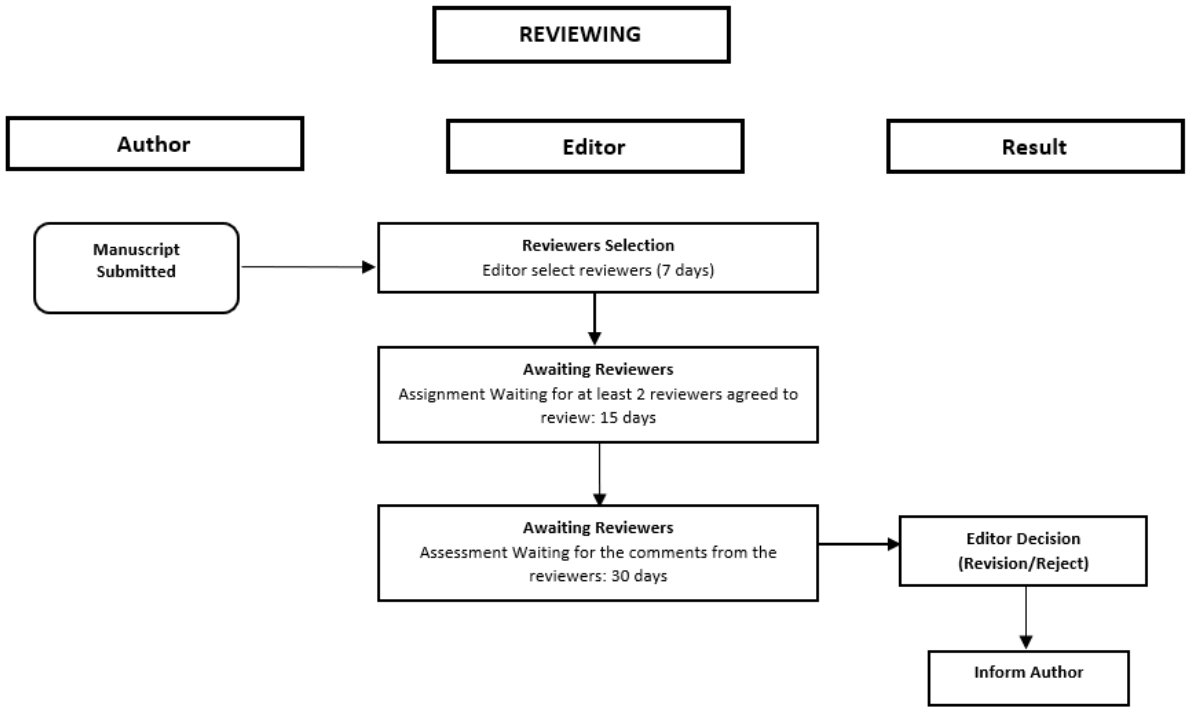
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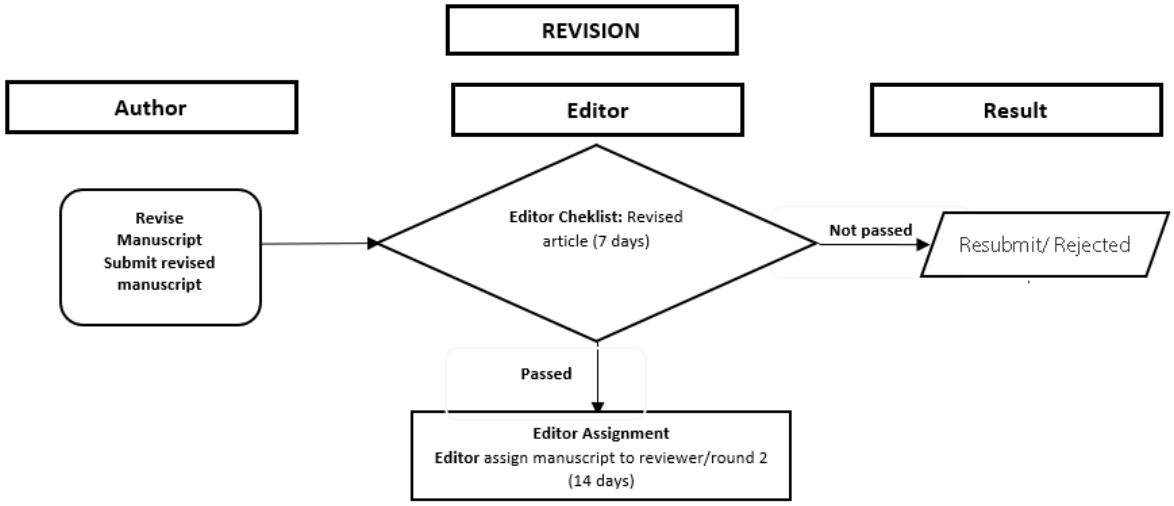

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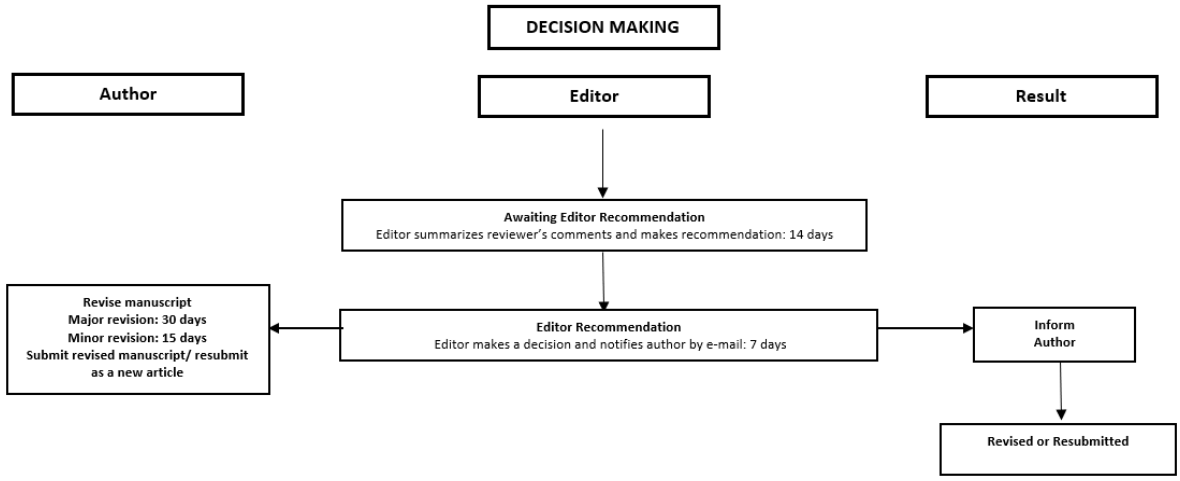

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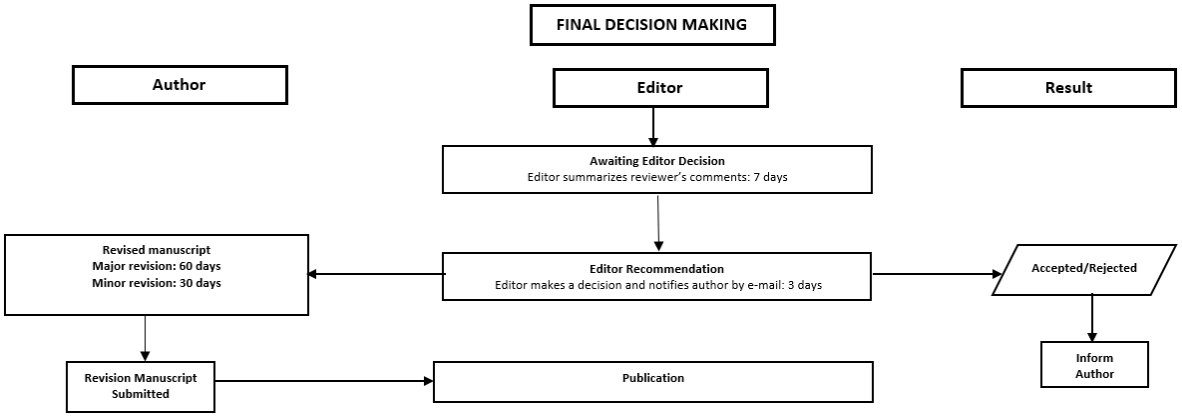

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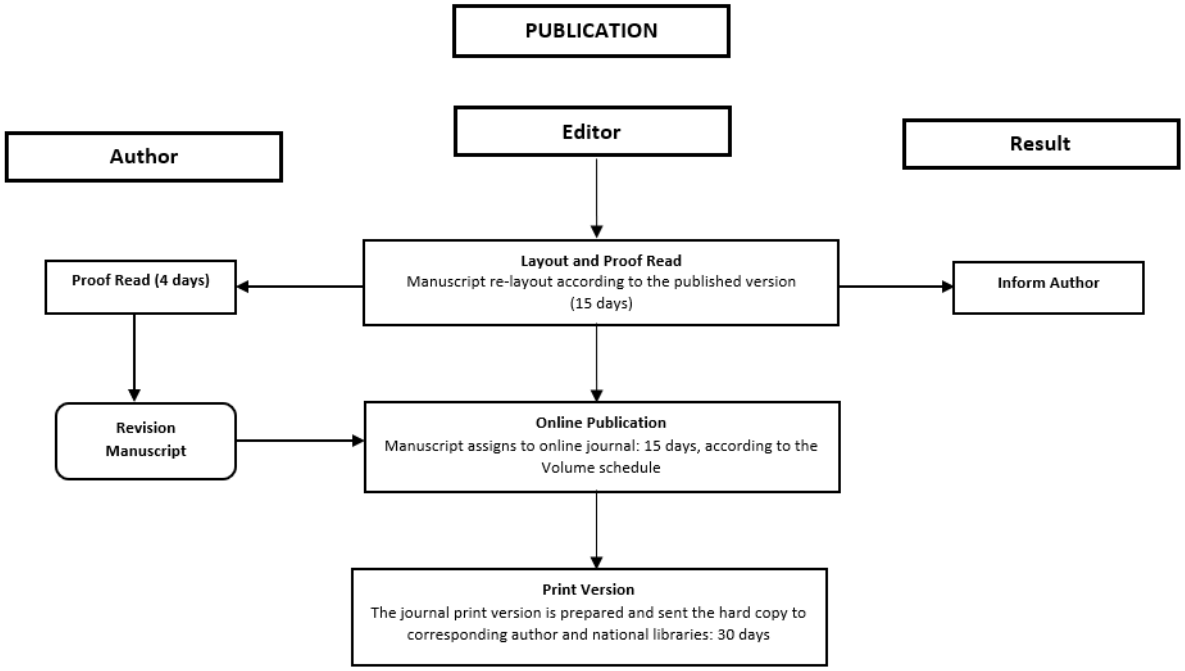

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ORIGINAL ARTICLE

GENDER, REGION, AND BACKGROUND-RELATED FACTORS INFLUENCING ADOLESCENT DISEASE-PREVENTION BEHAVIOR DURING THE COVID-19 PANDEMIC IN INDONESIA

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ABSTRACT

Raising awareness about disease prevention behavior in adolescents is an effective measure for reducing the transmission of COVID-19. This study aimed to examine adolescent disease-prevention behavior during the COVID-19 pandemic in Indonesia and identify its associations with gender, region, and background-related factors. This was a cross-sectional study that involved 492 respondents between the ages of 12 to 18 years and currently attending junior high school or senior high school. The Mann–Whitney *U* test and Kruskal–Wallis *H* test was used. The findings indicated that the mean age of the respondents was 15.77 (SD = 1.42), the majority of the respondents were girls (76.4%), and most were living in Eastern Indonesia (81.5%). Girls placed a significantly higher effort for prevention than boys for self-precaution, social distancing, and following coughing and sneezing etiquette, with mean (SD) values of 21.48 (SD = 2.79), 20.40 (SD = 2.89), and 17.73 (SD = 2.44), respectively. Gender and region also had significant correlations with reported self-protection, social distancing, and self-immunity enhancement behavior ($p< 0.05$). It can be concluded that COVID-19-prevention measures practiced by adolescents differ according to gender, region, education level, both parents' education level, and the father's occupation.

Keywords: Adolescents; COVID-19; factors; preventive behavior

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INTRODUCTION

The first case of coronavirus disease 2019 (COVID-19) was detected in Indonesia on March 02, 2020. By July 2020, Indonesia has the third-highest number of confirmed cases in Southeast Asia, standing at 74,018 cases, along with 3,535 deaths (Dezan Shira & Associates, 2020). Previous studies have also reported a higher COVID-19 incidence in adolescents and adults than in children (Cavalcante Pinto Júnior et al., 2021), a higher incidence in adolescents than in adults (Rumain et al., 2021), and similar seroprevalence in adolescents and adults (Viner et al., 2021). Furthermore, the mortality rate of COVID-19 was found to be higher in patients aged ≥ 10 years who were categorized with severe symptoms upon admission to a tertiary referral hospital in Indonesia (Dewi et al., 2021).

Adolescents have a higher risk of contracting the coronavirus infection if they are in an immune-compromised state, malnourished, have medical comorbidities, or have poor hygiene (Kar et al., 2020). COVID-19 can be transmitted to others by emitting liquid particles such as aerosols and droplets from the nose or mouth when the infected individual coughs, sneezes, or speaks (WHO, n.d.). The key factor in mitigating the spread of the disease is compliance with infection control protocols. Previous research suggests that young adults may exhibit low compliance with COVID-19 transmission control (Barari et al., 2020).

Those between the ages of 10 and 24 have a higher potential to spread the virus due to their need for social interaction, peer acceptance, and susceptibility to peer influence (Andrews et al., 2020). Moreover, young people tend to look healthy even though they are infected because they have an innate immune system response that allows their bodies to swiftly react to pathogens (Mallapaty, 2021)

The Indonesian government issued a policy on May 28, 2020, that the country would adopt a *new normal* as a transition mechanism to encourage a return to normal economic and social activities (Muhyiddin, 2020). However, the implementation of this policy without encoding it into law has led to new problems such as violations of COVID-19 prevention norms and public disobedience (Mokodongan et al., 2021).
Research indicated that adolescents had lower compliance with the government's anti-virus rules due to low trust (Nivette et al., 2020). Therefore, it is vital to increase awareness and promote positive behavior to change these adolescents' health practices (Dardas et al., 2020).

Prevention efforts against COVID-19 are widely applied in various regions in Indonesia. Cultural diversity in each region has an important role in the efforts taken to deal with the outbreak (Ayuningtyas et al., 2020). A study stated that among the people of Central Java, there are social phenomena related to public disobedience in implementing health protocols due to cultural transformations resulting from the adaptation of the new normal (Widisuseno & Sudarsih, 2021).

The most effective preventive behaviors against COVID-19 are physical distancing, avoiding touching the eyes, nose, and mouth, wearing a medical mask, and coughing or sneezing into a bent elbow or tissue (WHO, 2020b). A previous study from South Korea reported that wearing a mask was the most common preventive behavior among adolescents and social distancing was the lowest (Park & Oh, 2021). Moreover, evidence from Ethiopia revealed that older adolescents practiced more preventive measures than younger adolescents. These measures include improving the body's immunity, paying attention to the disease, restricting movement, sensitization to actions in the community, and substance use toward the outbreak of COVID-19 (Feyisa, 2021). However, existing research has not explained in detail the relationship between the components of preventive behavior and other related factors.

Furthermore, different countries also have different cultures and community habits. Research on preventive behavior in adolescents is important as their development requires socialization with peers and has the potential to spread COVID-19. Therefore, this study aims to examine the disease prevention behavior of adolescents during the COVID-19 pandemic and identify its association with gender, region, and background-related factors in adolescents.

METHOD

Study design

This is a quantitative research that used a descriptive survey method with a cross-sectional approach. Descriptive research was used as it aims to determine the prevalence of an event (Dahlan, 2018). This study was conducted using an online research platform.

Sample

The sample in this study was 492 teenagers who were selected by the convenience sampling technique. The inclusion criteria in this study included being 12–18 years of age or currently attending junior high school or senior high school, using a smartphone, having at least one social media application (e.g., WhatsApp, Instagram, Facebook, or Telegram), and able to use Google Forms. The exclusion criterion was respondents who did not submit the questionnaire.

Data collection

Data were collected via an online questionnaire that was distributed between October 14 to November 09, 2020. The study was conducted in the Eastern (Sulawesi, Bali, Nusa Tenggara, Maluku) and Western regions of Indonesia (Java, Sumatra, Kalimantan).

Instrument

The questionnaire was made using Google Forms and sent to the respondents through social media. The 19-item instrument consists of four types of questions that measure preventive behavior, i.e., self-disease prevention behavior, immunity enhancement, social distancing, and following coughing and sneezing etiquette. These behaviors were recommended in the COVID-19 prevention and control protocol published by the Ministry of Health, as part of the Directorate General of Disease Prevention and Control in Indonesia.

For the questionnaire, the Likert scale ranging from 1 to 5 (never to always) was used. A validity test on the 19 questions was performed using the Pearson Product Moment correlation. An r count value of one and r count > r table was also obtained, and this supports the validity of the instrument. A Cronbach's alpha value of 0.757 was also obtained, showing it to have good reliability.

Data analysis

The data were analyzed by calculating the frequency distributions of the respondent's characteristics and reported COVID-19-prevention behavior. Non-parametric statistical tests were used to assess the relationship between any two variables. The Mann–Whitney *U* test was used to examine the differences in the reported disease prevention behavior of adolescents with different characteristics, where the dependent variable was ordinal, and the independent variable comprised two categorical groups. The observations were not normally distributed. The Kruskal–Wallis *H* test was also used to evaluate group differences in instances where there were more than two independent groups. All groups had the same distribution. The results were judged as significant if the *p-value* < 0.05.

Ethical consideration

This research was approved by the Ethics Committee of the Hasanuddin University Faculty of Medicine with the ethical number: 499/UN4.6.4.5.31/PP36/2020.

RESULTS

The respondents' ages ranged from 12 to 18 with a mean (SD) of 15.77 (1.42). The total number of respondents was 492. A majority of the participants (453 respondents) obtained COVID-19 information from social media (92.1%) and 401 respondents resided in East Indonesia (81.5%). The majority had parents with a junior or senior high school education: 251 (51%) fathers and 270 (54.9%) mothers. As for parental occupation, 370 respondents (75.2%) had employed fathers and 335 respondents (68.1%) had mothers who were homemakers (Table 1).

Table 1. Respondents' characteristics and parental background (n = 492)

Characteristic	n (%)	Mean (SD)
Characteristics of respondents		
Age		15.77 (1.41)
Gender		
Boys	116 (23.6)	
Girls	376 (76.4)	
Grade		
Junior high school	214 (43.5)	
Senior high school	278 (56.5)	
Source of COVID-19 information	453(92.1)	
Media (print/electronic/social)	39 (7.9)	
Family/friends/health provider		
Region*		
East Indonesia	401(81.5)	
West Indonesia	91 (18.5)	
Parental characteristics		
Father's Education		
University	172(35.0)	
Junior/senior high school	251(51.0)	
Elementary school	69 (14.0)	
Mother's Education		
University	161 (32.7)	
Junior/senior high school	270 (54.9)	
Elementary school	61 (12.4)	
Father's occupation		
Government/private employee	370 (75.2)	
Farmer/laborer/fisherman	104 (21.1)	
Died	18 (3.7)	
Mother's occupation		
Working	157 (31.9)	
Housewife	335 (68.1)	

Abbreviation: COVID-19, Coronavirus Disease 2019; SD, Standard Deviation

**The research location during the measurement for East Indonesia consisted of Sulawesi, Bali, Nusa Tenggara, and Maluku, and West Indonesia consisted of Java, Sumatera, and Kalimantan*

The mean values for the four components of adolescent disease prevention behavior were compared. Self-protection had the highest mean (SD) score of 21.18 (3.08%), with a 95% CI of 20.91–21.45, followed by social distancing (20.19 [3.08], 95% CI: 19.91–20.46), immunity enhancement (19.59 [2.71], 95% CI: 19.35–19.83), and following coughing and sneezing etiquette (17.60 [2.65], 95% CI: 17.37–17.84) (Table 2).

Table 2. Adolescent disease-prevention behavior during the COVID-19 pandemic

Behavioral Components	Mean (SD)	95% Confidence Interval
Self-protection	21.18 (3.07)	20.91-21.45
Immunity enhancement	19.59 (2.71)	19.35-19.83
Social distancing	20.19 (3.08)	19.91-20.46
Application of coughing and sneezing etiquette	17.60 (2.65)	17.37-17.84

Abbreviation: COVID-19, Coronavirus Disease 2019; SD, Standard Deviation

The data was analyzed by evaluating the relationship between individual characteristics and adolescent preventive behavior in response to COVID-19. Significant associations were found between gender, region, and three of the components of COVID-19-disease prevention behavior, i.e., self-protection, social distancing, and self-immunity enhancement (*P-value* <0.05). Furthermore, the respondents' education level had a significant correlation with immunity enhancement (*P*-value = 0.002). Regarding parental background, the father's education level was found to be associated with social distancing and the father's occupation was associated with self-protection and social distancing. However, the source of COVID-19 information and the mother's occupation did not have statistically significant relationships with the adolescents' disease prevention behavior (Table 3).

Table 3. The association between characteristics and adolescent disease-prevention behavior during the COVID-19 pandemic (n = 492)

Variable	Self-protection		Immunity enhancement		Social distancing		Application of coughing and sneezing etiquette	
	Mean (SD)	*P-value*	Mean (SD)	*P-value*	Mean (SD)	*P-value*	Mean (SD)	*P-value*
Gender[a]		0.001*		0.001*		0.019*		0.254
Boys	20.22(3.67)		20.28(2.75)		19.51(3.53)		17.18(3.22)	
Girls	21.48(2.79)		19.38(2.66)		20.40(2.89)		17.73(2.44)	
Education grade[a]		0.572		0.002*		0.772		0.877
Junior high school	3.07(.21)		20.00(2.75)		20.21(3.25)		17.65(2.52)	
Senior high school	3.07(.18)		19.27(2.64)		20.17(3.12)		17.56(2.76)	
Source of COVID-19 information[a]		0.716		0.557		0.211		0.250
Media (print/electronic/social)	21.25(3.12)		19.52(2.57)		20.59(2.77)		17.87(2.73)	
Family/friends/health provider	21.81(2.18)		19.90(2.34)		20.97(2.49)		17.39(2.16)	
Father's education[b]		0.134		0.368		0.031*		0.438
University	21.41(2.92)		19.68(2.66)		20.52(3.07)		17.41(2.76)	
Junior/senior high school	21.23(3.03)		19.65(2.58)		20.18(3.02)		17.72(2.54)	
Elementary school	20.43(3.47)		19.16(3.20)		19.36(3.19)		17.65(2.78)	
Mother's education[b]								
University	21.40(2.76)	0.508	19.80(2.52)	0.096	20.60(3.09)	0.022*	17.63(2.65)	0.570
Junior/senior high school	21.11(3.26)		19.61(2.75)		20.09(3.11)		17.50(2.75)	
Elementary school	20.89(2.93)		18.92(2.93)		19.49(2.80)		17.97(2.19)	
Father's occupation[b]		0.009*		0.212		0.027*		0.340
Government/private employee	21.35(3.09)		19.72(2.67)		20.38(3.09)		17.68(2.63)	
Farmer/laborer/fisherman	20.51(2.94)		19.13(2.89)		19.62(3.01)		17.26(2.79)	
Died	21.56(2.92)		19.67(2.09)		19.56(2.85)		18.00(2.25)	
Mother's occupation[a]		0.801		0.065		0.107		0.551
Employee	21.17(3.01)		19.90(2.55)		20.46(3.15)		17.55(2.60)	
Housewife	21.19(3.09)		19.44(2.77)		20.06(3.04)		17.63(2.68)	
Region[a]		0.03*		0.03*		0.022*		0.184
East Indonesia	21.03(3.13)		19.46(2.76)		20.01(3.16)		17.50(2.76)	
West Indonesia	21.84(2.69)		20.18(2.35)		20.96(2.58)		18.04(2.09)	

Abbreviation: COVID-19, Coronavirus Disease 2019; SD, Standard Deviation
[a] Evaluated using Mann–Whitney U test
[b] Evaluated using Kruskal–Wallis H test
**Considered significant value P <0.05*

DISCUSSION

This study found that the most commonly practiced disease prevention behavior done by adolescents during the COVID-19 outbreak was self-protection. We defined self-protection as maintaining hand hygiene by using an alcohol-based hand sanitizer or soap and water, wearing a medical mask, and avoiding touching one's eyes, nose, and mouth. Our finding is supported by a global study that showed an improvement in personal protective measures such as hand washing, mask-wearing, and reducing face-touching behavior during the COVID-19 pandemic (Machida et al., 2020) (Chen et al., 2020).

Following coughing and sneezing protocols such as covering the nose and mouth with disposable tissue, or the inside of the elbow were less commonly practiced in our sample. Previous research has shown the potential of coughs and sneezes to spread respiratory viral infections, as they generate approximately 3,000 and 40,000 airborne droplets, respectively (Dhand & Li, 2020).

Gender was found to have a significant correlation with self-protection, social distancing, and enhancement of COVID-19-immunity. It was found that girls were more likely than boys to protect themselves against the spread of COVID-19 and avoid physical contact with others. This is consistent with previous studies which stated that the majority of female secondary school students adopted better behavior and had a higher level of knowledge on hand hygiene and personal protection than their male counterparts (Guzek et al., 2020). This also includes mask-wearing and physical distancing during the pandemic (Ningsih et al., 2021). Nevertheless, in our study, boys reported more behaviors that increase the body's immune response compared to girls. Previous literature has found that the immune response to the coronavirus differs between sexes, with males having weaker immune responses (i.e., antibodies and T-cells) to infection than females (Gadi et al., 2020) (Takahashi et al., 2020).

Furthermore, there were differences in behavior between those residing in different regions. Respondents from western Indonesia had the highest mean score for performing disease prevention behavior and reported significantly more self-protection, social distancing, and self-immunity behaviors than those residing elsewhere (P <0.05). This result contrasts a previous study that found no relationship between regions in Indonesia and attitudes toward COVID-19 (Muslih et al., 2021). Our research was conducted in October 2020, when the western Indonesian provinces of DKI Jakarta, East Java, West Java, and Central Java had the highest numbers of confirmed cases; those of DKI Jakarta, East Kalimantan, South Kalimantan, and East Java had the highest mortality rates (WHO, 2020a). Another study reported an association between regional COVID-19 morbidity and routine adolescent hand-washing, such as before and after meals, before and after using the restroom, and after handshaking (Skolmowska et al., 2020).

A relationship was also observed between parental education and social distancing practices. On average, teenagers of parents with a university-graduate educational level or equivalent, applied more social distancing. This result contrasts with the findings of a previous study that stated that parental education had no significant association with adolescent social distancing. This research is supported by Astuti et al., (2022) that the parental education has a significant influence on preventing the spread of COVID-19 in children. Whereas city lockdowns, parental rules, and social responsibility were associated with greater social distancing. The results of our study may be caused by a majority of educated parents helping their adolescent children to structure their time to balance physical activity and sedentary behaviors (Muñoz-Galiano et al., 2020). Parental support and attention to location and activity types may help to control their children's physical activity during the pandemic (Yomoda & Kurita, 2021). Moreover, the frequency of parent-adolescent conversations about COVID-19 has been found to influence adolescents' adherence to COVID-19 health disease prevention behaviors over the first year of the pandemic (Peplak et al., 2021).

The limitation of this study is that the data were collected via an online questionnaire, so the possibility of bias may occur as some of the target populations are not represented. However, several previous studies have been conducted with the same because direct sampling through surveys in communities or schools is not possible due to social distancing (Riiser et al., 2020) (Bazaid et al., 2020) (Meier et al., 2020).

CONCLUSION

This study found that self-protection was the most commonly reported disease prevention behavior in adolescents during the pandemic in Indonesia. The COVID-19-prevention measures practiced by adolescents differ according to gender, region, as well as the parent's education level and occupation. Hence, we suggest that interventions to increase disease prevention behavior should be targeted at boys and that action by parents is needed to limit the physical activities of adolescents, which would in turn limit the spread of COVID-19.

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ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN COVID-19 PREVENTION MEASURES AND QUALITY OF LIFE OF ELDERLY PATIENTS WITH HYPERTENSION DURING THE COVID-19 PANDEMIC

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ABSTRACT

Cardiovascular diseases, including arterial hypertension, are common comorbidities among the elderly due to COVID-19. This study aimed to determine the relationship between COVID-19 prevention measures and the quality of life for the elderly with hypertension during the COVID-19 pandemic. This was a descriptive correlation study that applied a cross-sectional approach that involved 133 respondents who were selected using the convenience sampling technique. Data were collected using questionnaires from the WHOQOL-BREF and COVID-19 prevention. The collected data were processed using the Chi-Square test. The results showed that the number of elderly participants who took positive and negative efforts in preventing COVID-19 transmission was almost equal, with a slightly higher number of participants taking positive efforts, with a total of 69 people (51.9%). There was also a higher number of elderly participants with a good quality of life, with 71 people (53.4%). The results indicated a relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic, with a p-value of 0.008. Therefore, it can be concluded that prevention efforts in the form of health behaviors for the elderly with certain chronic diseases comorbid with COVID-19 can affect their quality of life.

Keywords: COVID-19; elderly with hypertension; prevention measures; quality of life

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INTRODUCTION

Hypertension is a life-threatening, chronic, and non-communicable cardiovascular disease. It is also one of the main health problems in the elderly. As a disease that lasts for a lifetime which patients could not fully recover from, it is a silent killer (Indonesia's Ministry of Health, 2019). Kjeldsen *et al*. (2014) and Zhang (2015) explained that people in all age groups, including the elderly, are considered to be hypertensive if their blood pressure is persistently ≥ 140/90 mmHg after more than 2 examinations.

Many people with hypertension do not show complaints or symptoms. However, this condition may become a complication that causes death, with a prevalence rate that tends to increase with age (Indonesia's Ministry of Health, 2019). The prevalence of hypertension at the world level was 22%, of which more than 50% is experienced by the elderly (World Health Organization, 2019 in Indonesia's Ministry of Health, 2019). This situation also occurs in Indonesia. According to the Basic Health Research 2018 report, the prevalence of hypertension in Indonesia reached 34.1% and tends to increase with age (Indonesia's Health Research and Development Agency, 2018). The prevalence of hypertension in the 45-54-year age group is 45.3%, 55.2% in the 55-64-year age group, and 63.2% in the 65-74-year age group. Furthermore, the > 75-year age group has a 69.5% prevalence of hypertension (Indonesia's Ministry of Health, 2019).

This high prevalence of hypertension also occurs in Riau Province, as the region has a 29.14% prevalence of the disease, of which >50% of the patients with hypertension are the elderly (Indonesia's Ministry of Health, 2019). Data from the Pekanbaru Health Office stated that hypertension was the

second most common disease in Pekanbaru in 2020 and was experienced by 19,026 people (Pekanbaru Health Office, 2020).

According to Gunawan *et al*. (2021), elderly individuals with comorbid diseases are at a high risk of being infected with COVID-19 and have a higher risk of death. The most common comorbid disease experienced by the elderly is hypertension.

Based on data from the Center for Disease Control and Prevention (CDC), the 65 years and over age group has the highest mortality rate due to COVID-19 globally with a percentage of 76.1% (Centers for Disease Control and Prevention, 2021). Moreover, data from the Indonesian Basic Health Research described that hypertension is the highest comorbid condition of COVID-19 in the world, including in Indonesia, at 56.6% in the USA, 58.3% in China, 49% in Italy, and 50.5% in Indonesia (Indonesia's Ministry of Health, 2020). Moreover, data from Indonesia's COVID-19 Handling and National Economic Recovery Committee (2020) indicated that hypertension is a comorbid disease that is mostly found in COVID-19 sufferers (i.e., 50.5%) and is one of the potential factors for death due to COVID-19 based on comorbidities.

The high risk of COVID-19 in the elderly with hypertension will certainly cause anxiety and result in mood and emotional disturbances. This may lead to social interaction disorders due to the social restrictions enforced to prevent the transmission of this virus. In the elderly, this affects their quality of life.

Quality of life, according to the World Health Organization (WHO), is a person's perception in the context of culture and norms of where the person lives. It is related to goals, expectations, standards, and concerns during his/her life. Quality of life covers four aspects, namely, physical, psychological, social, and environmental aspects (Putri *et al*., 2015). Moreover, the quality of life of the elderly is influenced by their level of health, spirituality, self-esteem, and social support (Dewi, 2016; Rossyana Dewi, 2013).

A study conducted by Trevisol (2011) showed that individuals with hypertension have a low or poor quality of life compared to those with normal blood pressure. The findings from Bhandari *et al.* (2016) also supported this finding in their study regarding the quality of life of patients with hypertension in Kathmandu. The results of the study indicated that patients with hypertension had low quality of life and that this condition was in line with the patients' increasing age. The study was conducted in 2016, therefore, the results may indicate a worse condition if it was conducted during the COVID-19 pandemic.

The condition can be influenced by the behavior or efforts of the elderly, especially in preventing COVID-19. This is supported by a study conducted by Sari *et al*. (2017) which found a significant relationship between healthy living behavior and the quality of life of the elderly. According to the Director of Health Promotion and Community Empowerment of Indonesia's Ministry of Health, the Decree of Indonesia's Minister of Health (2020), the public must adapt their behavior to prevent the transmission of COVID-19. The behavior can be changed by being disciplined in following COVID-19 protocols, such as wearing a face mask, washing hands with soap in running water, and conducting social distancing or social restrictions by maintaining a minimum distance of 1 meter from other people. In addition, the WHO also recommends improving immunity by living a healthy lifestyle through the consumption of nutritious food, regular exercise, obtaining sufficient rest, stress avoidance, maintaining a clean house, and getting vaccinated (World Health Organization, 2020).

In this modern era, young adults are more familiar with technology than their elder counterparts. Therefore, they would rely on technology to conduct their daily activities from home, without the need to travel. Conversely, senior citizens tend to find it difficult to use technology, making them experience more extreme impacts during social restrictions. These impacts include feelings of loneliness, anxiety, and depression (Australian Psychological Society, 2020). But close contact with others who assist them may increase their risk of contracting COVID-19. Moreover, impaired cognitive function often occurs in elderly patients, making it difficult for them to understand the importance of implementing hygiene protocols. Consequently, their risk of contracting COVID-19 is higher. This is supported by a study conducted by Yang *et al.* (2020) in China, which indicated that the elderly are less likely to engage in appropriate COVID-19 prevention behaviors.

Furthermore, a preliminary study conducted in May 2021 by the Pekanbaru Health Office showed that the highest number of cases of hypertension in the elderly was found in the working area of the Rejosari Health Center. The results of interviews with eight elderly patients with hypertension indicated the following findings: seven of them stated that they were aware of the changes that had occurred during the pandemic: they tended to be more sensitive, slept a lot, lacked activity, rarely or even never went out of the house, were lazy to wear masks, and never checked their health condition. They also experienced anxiety due to their hypertension and their increased risk of contracting and dying from COVID-19. Only one out of eight elderlies said that there had been no change in their physical, psychological, and social aspects during the COVID-19 pandemic even though he rarely left the house and was lazy to use a face mask when meeting people.

Therefore, this research aims to study "the relationship between COVID-19 prevention measures and quality of life for the elderly with hypertension during the COVID-19 pandemic". To the best of our knowledge, this topic has never been studied, and this is the first research focusing on this topic that at the Rejosari Health Center in Pekanbaru city. A previous study has examined the relationship between living a healthy lifestyle and health promotion in the elderly with their general quality of life. In contrast with the study, the objective of this study was to determine the relationship between COVID-19 prevention measures and the quality of life for the elderly with hypertension during the COVID-19 pandemic.

METHOD

Study design

This was a descriptive correlation study with a cross-sectional approach. This research was conducted from August to December 2021.

Sample

A total of 133 respondents were selected using the convenience sampling technique. The inclusion criteria of the respondents were elderly hypertensive patients in the COVID-19 pandemic, able to communicate well, active and independent, and living in the working area of the Rejosari Health Center. The Slovin formula was used to calculate the minimum number of samples.

$n = N / (1 + (N \times e^2))$

N = population size
n = sample size
e = sampling error (0.05)

Instrument
Data in this study were collected using a questionnaire entitled the *World Health Organization Quality of Life – BREF* (WHOQOL-BREF) which has been standardized and validated. According to the WHO (2012) in Kiik *et al*. (2018), this instrument measures four important components, i.e., physical, psychological, social, and environmental relationships, consists of 26 question items and uses a Likert scale with a rating of 1 to 5. Furthermore, Caballero *et al*. (2013) in Kiik *et al*. (2018) stated that this WHOQOL-BREF instrument has good reliability as indicated by a Cronbach's alpha value of between 0.84 and 0.88, and good validity as shown by the *r*-value of 0.75. These results indicate that the questionnaire used is valid and reliable. In addition, another instrument was used to collect data on COVID-19 prevention measures, and this was compiled based on a literature review. The instrument was also in the form of a questionnaire which consisted of 19 questions regarding the application of health protocols, food intake, activity, exercise, and vaccinations. This instrument was tested and declared to be valid and reliable.

Data collection
This study was performed in Pekanbaru, specifically in the working area of the Rejosari Health Center which has the highest population of elderly patients with hypertension in the region. The initial stages of data collection included explaining the purpose of this study to the family of the respondents and distributing informed consent forms. If the families agreed, the respondents underwent the data collection process. In these stages, the researchers were assisted by enumerators and local health cadres.

Data analysis
The collected data were then processed in univariate and bivariate analyses using the SPSS software. The statistical test employed was the chi-square test. This was used to determine the relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic.

Ethical consideration
This study has received ethical approval from the Ethics Committee for Nursing and Health Research, Faculty of Nursing, the University of Riau with the Number: 216/UN.19.5.1.8/KEPK.FKp/2021, dated July 31, 2021.

RESULTS

Characteristics of elderly patients with hypertension
The frequency distribution of the characteristics of elderly patients with hypertension based on age, sex, education, marital status, occupation, and condition of hypertension (n = 133) is presented in Table 1.

Table 1. The frequency distribution of the characterristics of elderly patients

Characteristics	n (%)
Age	
60-74	106 (79.7)
75-90	27 (20.3)
Sex	
Male	50 (37.6)
Female	83 (62.4)
Education	
None	3 (2.3)
Elementary school	46 (34.6)
Junior high school	34 (25.6)
Senior high school	41 (30.8)
College	9 (6.8)
Marital Status	
Married	106 (79.7)
Widow/ widower	27 (20.3)
Working status	
Work	41 (30.8)
Not work	92 (69.2)
Length in suffering from hypertension	
< 5 Years	57 (42.9)
≥ 5 Years	76 (57.1)
Classification of hypertension	
Mild	20 (15)
Moderate	84 (63.2)
Severe	29 (21.8)

Table 1 shows that the majority of the respondents were aged 60-74 years, at 106 people (79.7%). Of which most were female, at 83 people (62.4%). Based on their education, most of them had a low level of education (junior high school and below), at 83 people (62.5%). Moreover, according to marital status, a majority of them were married, 106 people (79.7%). For the respondents' length of suffering from hypertension, most of them have suffered from hypertension for ≥ 5 years, at 76 people (57.1%). Furthermore, most of them had moderate hypertension at 84 people (63.2%).

The efforts taken by elderly patients with hypertension in preventing COVID-19 transmission

Table 2. The frequency distribution of the efforts taken by elderly patients with hypertension in preventing COVID-19 transmission

COVID-19 prevention measures	n (%)
Positive	69 (51.9)
Negative	64 (48.1)

Table 2 exhibits that the number of elderly patients who took positive and negative efforts in preventing COVID-19 transmission was almost equal, where those who took positive efforts were slightly higher at 69 people (51.9%).

The quality of life of elderly patients with hypertension during the COVID-19 pandemic

Table 3. The frequency distribution of the quality of life of elderly patients with hypertension during the COVID-19 pandemic

The quality of life of the elderly	n (%)
Physical dimension	
Good	62 (46.6)
Poor	71 (53.4)
Psychological dimension	
Good	37 (27.8)
Poor	96 (72.2)
Social dimension	
Good	74 (55.6)
Poor	59 (44.4)
Environmental dimension	
Good	72 (54.1)
Poor	61 (45.9)
Quality of Life (in general)	
Good	71 (53.4)
Poor	62 (46.6)

Table 3 shows that the quality of life of the majority of elderly patients with hypertension during the COVID-19 pandemic was poor based on the physical and psychological dimensions, totaling 71 (53.4%) and 96 people (72.2%), respectively. However, based on the social and environmental dimensions, their quality of life was good, totaling 74 (55.6%) and 72 people (54.1%), respectively. Furthermore, for quality of life as a whole, 53.4% (71 people) of elderly patients with hypertension had a good quality of life.

The relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension

Table 4. The relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic

COVID-19 prevention measures	Quality of Life of the elderly		Total	*p*-value
	Good	Poor	n (%)	0.008
	n (%)	n (%)		
Positive	45 (65.2)	24 (34.8)	69 (100)	
Negative	26 (40.6)	38 (59.4)	64 (100)	

The Chi-square test results show that there is a relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic with a p-value of 0.008.

DISCUSSION

As indicated in Table 1, the majority of our elderly respondents were female. Data from the Central Statistics Agency (2020) indicated that the life expectancy rate of citizens aged 60 years and over in Indonesia is considered high with a percentage of 64.29% and is expected to continue to increase every year. The results of a study conducted by Arifin *et al*. (2016) presented that the majority of hypertension sufferers were aged 60 years and over with a higher prevalence in women. Moreover, in Indonesia, the highest comorbid disease experienced by the elderly is hypertension (Gunawan et al., 2021).

In addition, Akbar *et al.* (2020) also found that elderly patients who suffer from hypertension are generally female (82.8%). This occurs because women experience menopause and a decline in hormones in the endocrine system, such as estrogen and progesterone. The decrease in estrogen hormone results in low levels of HDL (High-Density Lipoprotein) cholesterol and high levels of LDL (Low-Density Lipoprotein) cholesterol which affects the process of atherosclerosis. This condition can increase blood pressure in women (Riyadina *et al*., 2017).

Most of the elderly patients with hypertension in this study had a low level of education. This finding is in line with a study conducted by Herlinah *et al*. (2013) which found that the majority (79.8%) of the patients with hypertension had low education levels (junior high school and below). According to Anggara & Prayitno (2013), an individual's level of education affects their lifestyle as it may contribute to smoking habits, alcohol consumption, food intake, and physical activity that may have adverse effects on blood pressure in the elderly.

Based on marital status, most of the respondents in this study were married, A study conducted by Hanum & Lubis (2017) found that the majority of the hypertension sufferers in their study were also married.

For the length of suffering from hypertension, most of the elderly patients in this study have suffered from hypertension for ≥ 5 years. This is in line with the results of a study conducted by Prasetyorini *et al*. (2012) which also found that the majority of hypertension patients in their study have been suffering from hypertension for > 5 years. Furthermore, based on the severity, most of the elderly respondents in this study had moderate hypertension.

This study's results indicate that some of the elderly respondents have made positive efforts in implementing the health protocols set by the government and took several other preventive measures to prevent COVID-19 transmission, such as improving their body's immune system, maintaining environmental cleanliness, and willingness to get vaccinated (Decree of Indonesia's Minister of Health, 2020). The results of this study are in line with a study conducted by Al-Hanawi *et al.* (2020) which showed that they tend to perform good actions in preventing COVID-19 compared to younger people. This shows that the elderly are starting to care about their health. However, this behavior is influenced by self-efficacy, education level, as well as support from their families (Eunju Lee & Euna Park, 2017).

This study found that a majority of the respondents in this study had a poor quality of life based on the physical dimension. This is because they have had hypertension for more than five years. Indonesia's Ministry of Health (2019) describes hypertension as a lifelong chronic disease and a silent killer. The results of this study are in line with a study conducted by Santiya Anbarasan (2015) which showed that the quality of life of the majority of their elderly respondents based on the physical dimension was poor (71.7%). Furthermore, in this study, from the psychological dimension, the quality of life of the majority of the elderly respondents was also poor. However, based on the social and environmental dimensions, the quality of life of the elderly patients in this study was good. These findings are supported by a study conducted by Rossyana Dewi (2013) who discovered the same pattern. For the quality of life as a whole, the majority of the elderly patients with hypertension had a

good quality of life. This finding is in line with a study conducted by Santiya Anbarasan (2015).

Table 4 shows that there is a relationship between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic. These findings are based on the results of the chi-square test which indicated a *p*-value of 0.008 (< 0.05). This means that COVID-19 prevention measures correlate with the quality of life of elderly patients with hypertension. Sari *et al*. (2017) also found a significant relationship between healthy living behavior and the quality of life of the elderly, in which healthy behavior can result in an adequate quality of life and possibly a longer life. As stated by Ong-Artborirak & Seangpraw (2019), if one shows good self-care behavior, they will have good health which can lead to an increase in the person's quality of life.

Furthermore, the results of a study conducted by Li *et al*. (2018) indicated a relationship between a healthy lifestyle and the quality of life of elderly patients with hypertension. Continuous family support is expected necessary to maintain elderly's health, including their adherence to the treatment when they have disease (Iskandar et al., 2019). Nevertheless, the quality of life and healthy lifestyle must continuously improve. This finding is also in line with a study conducted by Lestari & Zakiah (2020) which concluded that the health behavior of the elderly affects their quality of life, in which poor health behavior may worsen their quality of life. They added that healthy behavior, especially in the elderly, must be comprehensive and continue to be improved and taught.

CONCLUSION AND RECOMMENDATION

A relationship was found between COVID-19 prevention measures and the quality of life of elderly patients with hypertension during the COVID-19 pandemic. It can be concluded that prevention efforts in the form of healthy behaviors for the elderly can affect their quality of life with certain chronic diseases that are comorbid with COVID-19. Therefore, nurses in health centers need to provide health education about various efforts to prevent COVID-19 transmission to the elderly with hypertension and their families to improve their quality of life.

This study was conducted using only questionnaires without observation guidelines related to the efforts taken to prevent COVID-19 in elderly patients with hypertension and their quality of life during the COVID-19 pandemic.

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ORIGINAL ARTICLE

THE USE OF A SCORECARD TO EVALUATE THE PUBLIC'S COMPREHENSION OF COVID-19: A PILOT STUDY

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ABSTRACT

The rapid spread of information and infodemic might result in public confusion and hinder the handling of the COVID-19 pandemic. Public comprehension of COVID-19 as part of health literacy is an important determinant to filter hoaxes from facts. Therefore, a scoring card called the Karlivid (the COVID-19 literacy and public vaccination scorecard) was developed to evaluate the individual's comprehension level of COVID-19. A pilot study was conducted with this scoring card. The participants were recruited via consecutive random sampling by using emails from the researcher's contact list (n=92). A total of 78.3% of the respondents were considered to have an adequate comprehension level. Approximately 77% of all respondents agreed that this card could help them know their comprehension level, 81.5% agreed that this card could improve their comprehension, 81.5% agreed that the items in this card could help them screen facts from hoaxes, and 81.5% agreed that the language used was easily understood by the laypersons. Therefore, the Karlivid is a valid and reliable scorecard that can be used to evaluate public comprehension of COVID-19. Most of the respondents also had a good level of comprehension of this assigned topic.

Keywords: Comprehension; COVID-19; health education; karlivid; vaccine

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INTRODUCTION

Literacy can be defined as an individual's capability to write and read as well as the ability to synthesize information and knowledge in managing daily life. Since the development of the internet, reliable information can be more easily obtained by filtering correct the sources. Digital literacy has become a necessity to filter hoaxes and falses (Sianturi et al., 2021). Eisenberg, Johnson, and Berkowitz (2010) created the information literacy model called "The Big 6 Skills". This is formed by formulating the problems, identifying the information needed, developing a strategy of information mining to determine good information sources, organizing and presenting the information, and evaluating the efficiency and effectiveness of the mined information. Additionally, Shapiro and Hughes (1996) in their article titled "Information Literacy as a Liberal Art" stated that information literacy can be used as a foundation to build a literacy model that can be adjusted to users' needs (Shapiro & Hughes, 1996).

In Indonesia, literacy on COVID-19 and its vaccination still need to be nurtured. Previous studies conducted in Semarang (n=400) and the greater Jakarta area (n=839) have shown that public compliance with health protocols and government regulations is still quite low, causing outbreaks in several areas (Erawati, 2021; Rosha et al., 2021). Some people are hesitant to receive the COVID-19 vaccines due to various reasons, i.e., the conspiracy theory of certain parties to monopolize the vaccine and the potential side effects of vaccination (Akther & Nur, 2022; Rahmawati et al., 2021; Z.

Yang et al., 2021). These reasons lead to the public's distrust of the COVID-19 vaccine, thereby hindering government targets to achieve wider vaccination coverage to achieve herd immunity (Batrinca & Treleaven, 2015; Okan et al., 2020).

These phenomena are believed to arise from the unpredictable nature of COVID-19 and an ongoing pandemic of quickly-spreading misinformation and hoaxes—so-called infodemic—via various platforms including the internet. Furthermore, news on how people who have been vaccinated could still be infected may alter the perception of the COVID-19 vaccination (Ifroh & Asrianti, 2020; Sagan et al., 2021; Sridhar, 2020).

Conversely, the growing number of novel phrases that arise during the pandemic can be posed as additional challenges for laypersons, i.e., positivity rate, confirmed antigen swab and/or RT-PCR, variants of mutations, m-RNA based-vaccine versus weakened virus based-vaccine, social and physical distancing, spike proteins, SARS-Cov2 virus, and cytokine storm (Adhikari et al., 2020; Hu et al., 2021). Validated information must be obtained via government channels and/or scientific journals. However, the availability and growing development of research on these topics have been vast and dynamic. Thus, people need to know how to correctly screen the information they obtain. Therefore, this pilot study was conducted to determine the validity and reliability of the self-developed scorecard (Karlivid) as a measuring tool for people's comprehension of COVID-19 (Harapan et al., 2020; Rachmani et al., 2019).

METHOD

Study design

This study used a cross-sectional survey to determine the respondents' comprehension of COVID-19. Data were obtained via the self-filled scoring card. The development of the scoring card and the analysis of the responses of respondents were performed between October 2021 and February 2022.

Sample

The respondents were openly recruited via email by consecutive sampling methods. The email addresses were obtained through the researcher's contact list. The inclusion criteria were healthy adults aged more than 18 years old, able to read and comprehend the survey, native speakers of Bahasa Indonesia, have internet access, and agree and consent for the results to be published anonymously. In this study, a sample-to-item ratio of 10:1 was used with a minimum of 90 participants selected (Memon et al., 2020).

Instrument

A scorecard containing 9 questions related to COVID-19 and its vaccination was developed by a team of medical doctors and students. The contents of the instruments were developed from several published works of the literature (Adhikari et al., 2020; Erawati, 2021; Harapan et al., 2020). All items on the scorecard were selected to assess the public's health comprehension of COVID-19, where content validity and face validity were carefully performed (Adhikari et al., 2020; Erawati, 2021; Harapan et al., 2020). A total of 2 questions were scored from 2-0 (0=disagree, 1=neutral, 2=agree), while the other 7 questions were scored from 0-2 (0=agree, 1=neutral, 2=disagree). The 9 questions were formulated to capture the respondents' comprehension of COVID-19 and its vaccination; each question was pre-tested and thus could be understood by laypersons and completed by them anonymously. The total point was then summed; an individual with a total score of 12 or more was considered to have an adequate comprehension level, while a lower score was considered inadequate (Wijaya & Kloping, 2021). The language used in this card is Bahasa Indonesia as the main target was to provide a self-assessment of an individual's comprehension of COVID-19 among Indonesian people. The English translation is shown in Table 1.

Table 1. The scorecard on COVID-19 and its vaccination information literacy (a self-sufficient method to gauge your comprehension of the aforementioned topics)

No.	Question	Value	Score
1	Comorbidities are diseases and/or abnormal conditions, such as being overweight, obesity, hypertension, diabetes mellitus, cancer, and autoimmune disorders, and these might affect the illness severity of COVID-19.	Agree=2, Neutral=1, Disagree=0.	
2	Information on COVID-19 and its vaccination is dynamic and follows updated situations and conditions.		
3	It is not mandatory for individuals who have been confirmed with COVID-19 to uphold health protocols due to acquired immunity.	Agree=0, Neutral=1, Disagree=2.	
4	Vaccination makes a person immune to the disease.		
5	The infection risk of COVID-19 does not affect the number of people who have been vaccinated.		
6	The brand of the COVID-19 vaccine determines its effectiveness due to the country that produced the vaccine.		
7	COVID-19 vaccination is not needed for people who had influenza and/or pneumonia vaccination.		
8	It is not mandatory for individuals who have been vaccinated with COVID-19 to uphold health protocols (wearing a face mask, washing hands, physical distancing, and avoiding crowds) due to their body's immunity.		
9	Any information on COVID-19 and its vaccination from the internet is correct.		
	TOTAL (More than 12: good, less than 12: insufficient)		

Four questions were asked to determine the usefulness of Karlivid, i.e., whether they agreed that this card could help them determine their comprehension level, whether they agreed that this card could improve their comprehension, whether they agreed that the items in this card could help them screen facts from hoaxes, and whether they agreed that the language used were easily understood by laypersons.

Data collection

The electronic version of the scorecard was uploaded as a Google Form, and the hyperlink was attached to the

Instagram page called @covid19center_fkunair. The responses were collected from November 1st until November 30th, 2021, via a Google Form. This scorecard was also uploaded to https://COVID-19fkua.blogspot.com/ alongside its Instagram page. On these 2 platforms, updated news on COVID-19 and its vaccination was screened from the Indonesian Government's official websites, i.e., https://covid19.go.id; the Instagram account of @satgas covid19.id; infocovid19.jatimprov.go.id; lawanCOVID-19.surabaya.go.id; https://kemkes.go.id; an official application with national-based coverage called PeduliLindungi application; as well as peer-reviewed scientific articles on the Pubmed and Science Direct databases. Thus, it is expected that internet users who are looking for information related to COVID-19 can find our Blogspot page and fill out the scorecard.

Data analysis

Incomplete responses or multiple takers were excluded. The statistical analysis of the results and survey items was conducted using SPSS 17.0 (IBM, Chicago, IL, USA). Descriptive analysis was performed on the sociodemographic aspects of all respondents, in addition to their individual opinions on the Karlivid. The frequency of each item's response was also calculated for males and females. A Chi-square test was performed to determine any differences between sex groups with the significance level defined as a p-value of <0.05 (SPSS 17.0, USA).

Ethical considerations

This study was targeted as a community service activity and ethical clearance was obtained from the Faculty of Medicine, Universitas Airlangga No.145/EC/KEPK/FKUA/2021, dated 26-07-2021. Informed consent was obtained by clicking the agreement button.

RESULTS

The development of Karlivid as a scorecard to evaluate individual comprehension of COVID-19 took approximately one month before its upload to a research blog (https://COVID-19fkua.blogspot.com/). Public comprehend sion of COVID-19 is vital for individuals to understand their health situation during the pandemic and act accordingly. In this study, the age of the respondents was between 18-30 years. Sex difference has been reported to affect these values (Flor et al., 2022; Galasso et al., 2020; Rosha et al., 2021) and therefore analyzed in our pilot study. All items have passed the validity test (n=76, r table of 0.05 is 0.223) and the reliability test (n=76, r table of 0.05 is 0.223, Cronbach's alpha > 0.6). All respondents agreed that the items were easily understood by laypersons (81.5%). After completion of the scorecard, the respondents claimed that they understood the importance of COVID-19 and its vaccination (77%); the items in the scoring cards helped them to become aware of the importance of news screening on the assigned topics (81.5%); and that the scorecard was useful for increasing their comprehension level on COVID-19 and its vaccination (81.5%). After these steps, we recruited respondents for the pilot study to evaluate public comprehension levels via Karlivid. The total number of respondents was 92 (29 males and 63 females).

It was observed that 73 respondents had an adequate level of health comprehension (79.3%). The frequency of each response for each item was analyzed to understand potential differences in the comprehension levels amongst these respondents. For item number 1 (comorbidities are diseases and/or abnormal conditions such as being overweight, obesity, hypertension, diabetes mellitus, cancer, autoimmune disorders, and these might affect the illness severity of COVID-19), 76% of respondents agreed; for the 2nd item (information on COVID-19 and its vaccination is dynamic and follows the updated situations and conditions), 90% agreed; for the 3rd item (it is not mandatory for individuals who have been confirmed with COVID-19 to uphold the health protocols due to acquired immunity), 16% agreed. For item number 4 (vaccination makes a person immune to the disease), 32% agreed; for item number 5 (the infection risk of COVID-19 does not affect the number of people who have been vaccinated), 40% agreed and 45% disagreed; for item number 6 (the brand of COVID-19 vaccine determines the vaccination effectiveness due to the country that produced the vaccine), 42% agreed. Next, for item number 7 (COVID-19 vaccination is not needed for people who had influenza and/or pneumonia vaccinations), 67% disagreed; for item number 8 (It is not mandatory for individuals who have been vaccinated with the COVID-19 vaccination to uphold health protocols, e.g., wearing face masks, washing hands, physical distancing, and avoiding crowds, due to their body's immunity), 94% disagreed; for item number 9 (any information on COVID-19 and its vaccination from the internet are correct), 86% disagreed. Furthermore, there are no statistically significant differences in the response type of each item between men and women (p>0.05). The analysis of the participant's responses is shown in Table 2.

Table 2. Analysis of the participant's scorecard responses (Karlivid)

No	Question	Respondents	Frequency (n, %)			P-Value (Chi-square)
			Agree	Neutral	Disagree	
1	Comorbidities are diseases and/or abnormal conditions such as being overweight, obesity, hypertension, diabetes mellitus, cancer, and autoimmune disorders, and these might affect the illness severity of COVID-19.	Male	23	4	2	0.49
		Female	47	14	2	
	Total		70 (76%)	18 (20%)	4 (4%)	
2	Information on COVID-19 and its vaccination is dynamic and follows the updated situations and conditions.	Male	27	2	0	0.61
		Female	56	5	2	
	Total		83 (90%)	7 (8%)	2 (2%)	
3	It is not mandatory for individuals who have been confirmed with COVID-19 to uphold health protocols due to acquired immunity.	Male	7	3	19	0.37
		Female	8	6	49	
	Total		15 (16%)	9 (10%)	68 (74%)	

No	Question	Respondents	Frequency (n, %)			P-Value (Chi-square)
			Agree	Neutral	Disagree	
4	Vaccination makes a person immune to the disease.	Male	9	3	17	0.93
		Female	20	5	38	
	Total		29 (32%)	8 (8%)	55 (60%)	
5	The infection risk of COVID-19 does not affect the number of people who have been vaccinated.	Male	12	4	13	0.96
		Female	25	10	28	
	Total		37 (40%)	14 (15%)	41 (45%)	
6	The brand of the COVID-19 vaccine determines its efficacy due to the country that produced the vaccine.	Male	14	9	6	0.31
		Female	25	15	23	
	Total		39 (42%)	24 (26%)	29 (32%)	
7	COVID-19 vaccination is not needed for people who had influenza and/or pneumonia vaccination.	Male	3	9	17	0.40
		Female	3	15	45	
	Total		6 (7%)	24 (26%)	62 (67%)	
8	It is not mandatory for individuals who have been vaccinated with COVID-19 vaccination to uphold health protocols (wearing face masks, washing hands, physical distancing, and avoiding crowds) due to their body's immunity.	Male	2	2	25	0.16
		Female	1	1	61	
	Total		3 (3%)	3 (3%)	86 (94%)	
9	Any information on COVID-19 and its vaccination from the internet is correct.	Male	1	4	24	0.66
		Female	3	5	55	
	Total		4 (4%)	9 (10%)	79 (86%)	

DISCUSSION

In this study, a higher percentage of the respondents had adequate health comprehension of COVID-19 and its vaccine compared to those with inadequate comprehension. This is in line with a study conducted during the early pandemic period of the COVID-19 pandemic in Indonesia (Triyanto & Kusumawardani, 2020). However, contrary to a previous survey about COVID-19 health literacy conducted in East Kalimantan (Ifroh & Asrianti, 2020), we found no significant differences in the type of responses between men and women who answered each item in the scorecard; both groups generally had a good understanding of the subjects. In terms of the usefulness of the scorecard, most respondents agreed that this card contained items with easily understood language and could raise their awareness of the importance of filtering any information regarding COVID-19 and its vaccination. Most of them also agreed that by filling in this card, they obtained a general idea of their health comprehension level and gained some good information as well.

Literacy regarding COVID-19 and its vaccination can be affected by several factors, including education level and the individual's experience on the related topics. Moreover, the language and content of the information also play a vital role. Other factors determine this literacy, such as the individual's environment, their technology adeptness, their personal needs and interests, socio-culture, habits, and beliefs (Li & Liu, 2020; Pechrapa et al., 2021; P. Yang et al., 2021). A reading habit can be developed to help people raise their literacy on certain subjects, including COVID-19 and its vaccination. Nowadays, for many people, the internet is their main source of information. While almost unlimited data might be sought via the internet, filtering facts from hoaxes can be quite a challenge. Furthermore, the confirmation of information to authority and/or field experts may be difficult, especially for the elderly and children (Brashier & Schacter, 2020; Herrero-Diz et al., 2020).

In this study, we explored balanced opinions on whether the brand of certain vaccines would determine their efficacy. However, this result must be taken wisely due to the relatively small sample and the limited variables studied. People's opinions might also change due to the availability of news and data they obtain, and the data on the COVID-19 vaccine is still growing.

Information literacy is a part of a basic process that is required to produce a high-quality workforce in various departments including in the social, political, economic, and cultural areas (Tilvawala et al., 2009). At the individual level, this soft skill is particularly useful because adequate health literacy on COVID-19 and its vaccination would determine how a person reacts in daily life. For example, it would affect how they would uphold health protocols as a form of protection for themselves as well as for others and to become vaccinated despite what other people may think or say. This attitude could be spread to others and might be good for the growth of new values, a new way of thinking, and a new way of life (Saad-Roy et al., 2020).

This study found that the larger part of respondents had a good comprehension of how comorbidities may lead to worse COVID-19 symptoms. They mostly agreed that the dynamic nature of information regarding COVID-19 and its vaccination must be taken into consideration, that vaccination could raise their immunity against COVID-19, and that health protocols must be upheld by all, including those who have contracted the disease and those whose have been vaccinated. However, lots of these people have not yet comprehended

the importance of vaccination as a vital part of the public effort to reduce the risk of infection from COVID-19, thus decreasing the positivity rate (WHO, 2021).

In Indonesia, the distribution of the COVID-19 vaccine has been a national project that started in February 2021. This activity is provided via health facilities in all district areas in Indonesia, with priority given to health providers and public servants, followed by all clusters of the community and children up to six years old (Isbaniah et al., 2020). By January 2022, according to the Ministry of Health's report (Kemenkes RI, 2022), approximately 180 million 1st doses and 125 million 2nd doses of the COVID-19 vaccine have been administered in Indonesia. At the beginning of January 2022, the third dose of booster vaccine has also been provided to the public. Although this may seem like a large statistic, the end target is a long way to go, as the country's total population reaches approximately 270 million people spread over the archipelago. The vaccination was given for free as part of the government's program to combat the disease (Rahmanti et al., 2021; Setiati & Azwar, 2020). By knowing the information literacy levels on these topics, people would be more aware of the situation and hopefully would act accordingly.

This was a pilot study that served dual purposes, namely, to build the Karlivid scorecard with items that had acceptable validity and reliability levels, and to also determine the public's initial comprehension of the COVID-19 virus on a small scale.

There are several limitations to our study. Firstly, this research has a relatively small number of respondents due to its nature as a pilot study. The content of the blog is also still evolving to include various types of educational methods on these subjects. Moreover, a consecutive random sampling approach was applied and the majority of the respondents were between the ages of 18-30 years old. In this study, the difference of each item was analyzed only between sexes, while other factors, i.e., age group, educational level, economic status, occupation, and digital literacy level, could also be taken into consideration for its relationship with health literacy.

CONCLUSION AND RECOMMENDATION

We succeeded to develop the Karlivid scorecard with good validity and reliability levels. This scorecard is novel in Indonesia and was uploaded to a research blog. In this pilot study, we observed good comprehension levels regarding COVID-19 among the majority of the respondents, which suggests a positive value for the current quality of public health literacy. Future studies with a larger number of respondents are necessary to evaluate the Indonesian people's health literacy on COVID-19.

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ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN PERCEIVED WORKLOAD AND ORGANIZATIONAL JUSTICE TOWARD NURSES' INTENTION TO LEAVE THEIR PROFESSION

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ABSTRACT

Perceived workload and organizational justice are significantly correlated with nurses' intention to leave. However, limited studies have used a large sample to investigate this association. Therefore, this study aims to identify the association between perceived workload and organizational justice on nurses' intention to leave. A cross-sectional online survey was conducted among 278 nurses by the simplified snowball sampling technique method from five hospitals in Surabaya, East Java Province, Indonesia. Adjusted odds ratios (AORs) and multiple linear regression were employed for data analysis. Perceived workload had increased intention to leave by 0.251-fold (95% CI = 0.20 to 0.31; p = <0.001). In addition, individuals with a high score of organizational justice are negatively associated with intention to leave -0.144 (95% CI = -0.19 to -0.10; p = <0.001) after the covariate variable has been adjusted. This study found a significant independent correlation between perceived workload and organizational justice toward nurses' intention to leave. This suggests that nurses are more likely to consider leaving their jobs when they perceive a more significant workload and receive less organizational justice through policies and practices that intend to replenish resources.

Keywords: Intention to leave; organizational justice; nurses; perceived workload

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INTRODUCTION

The global nursing shortage has been a significant issue and a growing concern for the healthcare system (Bourgault, 2022; Marć et al., 2019). The position's escalating turnover rate is one of the primary causes of nursing shortage (Al Zamel et al., 2020; Burmeister et al., 2019), and central to predicting turnover is the nurses' intention to leave (Slater et al., 2021). Turnover is frequently superseded by intentions to leave the organization (Huang et al., 2019). Notably, the intention to leave is a thinking process that includes decision-making about leaving a job position. Although this is one of the stages taken before employees resign, it does not always lead to actual leaving (Chao et al., 2015; Sharififard et al., 2019). Previous studies revealed that globally, there are various rates for an employee's intention to leave, such as 18.29% in China (Huang et al., 2019) and 21% in the United States (Koehler & Olds, 2022). Furthermore, intention to leave rates varies from 15.1% to 44.3% in developing countries (Duffield et al., 2014). In Indonesia, previous studies revealed that approximately 26.50% (Lukman et al., 2020) to 55.79% (Dewi et al., 2020) of nurses had the intention to leave. Interestingly, no extensive research with a large sample has explored the factors contributing to the high level of intention to leave among nurses in Indonesia. Thus, a study investigating the reasons behind nurses' intention to leave their profession in Indonesia is of high importance.

Perceived workload goes beyond staffing measurements to capture nurses' perceptions and experiences, as it also provides a thorough assessment of nurses' work from their perspective and personal experiences (Dhaini et al., 2022; Magalhães et al., 2017). Perceived workload as a multidimensional concept describes the time required to complete a task as well as its mental and physical demands

(Smith & Smith, 2017). Moreover, workloads that affect the health and work-life balance satisfaction of nurses are some of the factors considered before leaving the occupation (Holland et al., 2019; MacPhee et al., 2017). However, no study with a large sample size has explored the relationship between perceived workload and intention to leave among nursing, especially in Surabaya, East Java Province, Indonesia.

Organizational justice is one of the key factors behind the intention to leave among nurses (Fardid et al., 2018). Furthermore, organizational justice may extend beyond nurse retention and has major implications for both organizational and nursing staff (Xu et al., 2020). In other words, nurses who perceive greater organizational justice are more committed to their organizations and are less likely to leave their hospitals (Hashish, 2020; Mengstie, 2020). Consequently, identifying the relationship between organizational justice and its influence on nurses' intention to leave an organization should be further explored.

The correlation between perceived workload and organizational justice on intention to leave has also been found in developing and developed countries, such as the United States and Canada. However, the different cultural perspectives of perceived workload and organizational justice conduction may prevent the applicability of other studies' effects on Indonesian nurses. Previous studies have found that cultural differences could still impact organizational justice (Hashish, 2020) and workload (Viotti et al., 2018) as it relates to workplace misconduct as well as intention to leave. Moreover, perceived workload and organizational justice were found to be significantly correlated with nurses' intention to leave, but limited studies have used a large sample size to investigate this association. Therefore, the relationship between organizational work justice and workload on the intention to leave among nurses in Indonesia is important to examine. This study investigates the effect of perceived workload and organizational justice regarding the intention to leave among Indonesian nurses at five hospitals in Surabaya, East Java Province, Indonesia.

METHOD

Study design

A cross-sectional design was used to investigate the effect of perceived workload and organizational justice regarding the intention to leave among Indonesian nurses at five hospitals in Surabaya, East Java Province, Indonesia.

Setting and sample

Primary data was collected by using a clinical-based survey of a representative sample of respondents from five hospitals, consisting of two public hospitals and three private hospitals in Surabaya, East Java, Indonesia. The inclusion criteria were nurses who provided direct patient care, have been employed as nurses for more than six months, and volunteered to participate willingly. Unit managers and clinical resource nurses were excluded from this study because they dictated organizational policies, processes, and procedures. Moreover, they oversee registered nurses but do not provide direct patient care.

To estimate the sample size, G-Power Version 3.1 was used with Cohen's effect size of 0.37 (Mengstie, 2020), an alpha level of 0.05, and a power value of 0.8. The sample size generated was 187 participants. Considering an estimated attrition rate of 20%, we elevated our total sample size to 224 participants. However, after the data collection process, our final sample size reached up to 278 participants.

Data collection

The online survey was distributed through a Google Form that was shared through a social media platform, i.e., WhatsApp, to the head of nursing and some nurses in the target hospitals. The respondents were chosen by using a simplified snowball sampling technique and were requested to forward the invitation to their colleagues; the survey was predicted to take 15 minutes to complete. During the data collection period from 20 February 2022 to 20 March 2022, a variety of methods was utilized to obtain as many respondents as possible from the target hospitals. A total of 278 nurses filled out the Google Form survey.

The Google Form survey had four sections: (1) Before allowing participants to proceed with the survey questions, the first section informed them of the study's objectives and eligibility requirements. Next, the respondents indicated their informed consent by checking the box "Agree", which confirmed that they understood the authorization information and met the inclusion and exclusion criteria. This section also indicated the respondents' decision to participate voluntarily and acknowledgment that they have the freedom to withdraw at any time; (2) The second section comprised of questions correlated to sociodemographic factors; (3) The third section contained several questionnaires regarding perceived workload, organizational justice, and intention to leave. Finally, the last page expressed our gratitude and encouragement for all individuals who completed the survey to persuade their colleagues to participate by forwarding the link to the online survey.

Measurements

Demographic characteristics and work-related variables

The demographic and work-related variable questions contained age, gender, marital status, educational level, total years worked at the current hospital, work department, income, total bed count, type of hospital, and religion.

Nurses' intention to leave

This study used the nurses' level of adaptation (Kim & Leung, 2007) and modification (Zahednezhad et al., 2021) to measure their intention to leave. Three question items were assessed on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with higher scores representing higher intention to leave work. Kim and Leung (2007) reported that Cronbach's alpha of the questionnaire in American, Korean, Chinese, and Japanese samples were 0.92, 0.91, 0.92, and 0.93, respectively. In previous studies, Cronbach's alpha was used to measure the reliability of the scale and was estimated to be 0.90 (Zahednezhad et al., 2021). Therefore, for this present study, the Cronbach's alpha used was 0.88.

Organizational justice

The organizational justice measure was used to explore nurses' perceptions of organizational justice (Niehoff & Moorman, 1993). This study used an adaptation of the organizational justice questionnaire which contains 22 questions and used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Previous studies have found that higher scores indicate a greater perception of justice and implementation in a nursing population with a Cronbach's alpha of 0.80 (Zahednezhad et al., 2021). Thus, the Cronbach's alpha used for this study was 0.90.

Perceived workload

The perception of quantitative workload was evaluated using Spector and Jex's (1998) five-item questions with a five-point scale. The responses to each question ranged from 1 (less than once each month) to 5 (multiple times per day) (Spector

& Jex, 1998). Higher scores indicate a high level of workload status. Previous studies have found that a Cronbach's alpha of 0.77 indicates acceptable reliability. Therefore, for this research, the Cronbach's alpha was 0.88.

Data analysis

The frequency (n), percentages (%), and distribution of the demographic characteristics and determining factors between groups were calculated. Continuous variables were also examined with an independent t-test, Pearson's correlation, or Spearman's rank correlation, as applicable, using means and standard deviations (SD). Furthermore, Z-scores for skewness and kurtosis were used to assess the normality of the data, and Z-scores of <3.29 were considered to have normal distribution (Kim, 2013; Rias et al., 2020). Multicollinearity was assessed using a variance inflation factor (VIF) of <10 (García et al., 2015; Kurniasari et al., 2021). This study had a maximum VIF of 3.76, this indicates that our data has a low impact on multicollinearity. The adjusted coefficients and 95% confidence intervals (CIs) were derived by applying a multiple linear regression for the intention to leave due to exposure of interest. This is done after controlling for potential confounding variables such as age, gender, marital status, educational level, total years worked at the current hospital, area of practice, nationality, salary, and working hours per week.

Ethical consideration

The Ethical Review Board of Institut Ilmu Kesehatan STRADA Indonesia analyzed and approved the protocol to guarantee that the rights of the participants were fully protected (No : 2875/KEPK/II/2022). The respondents were well-informed about the objectives of the research. After the written informed consent from each participant was obtained, all data were gathered and handled with confidentiality and anonymity.

RESULTS

Table 1 shows the participants' demographic characteristics. In total, 51.8% of this study's participants were female participants and 81.7% were Moslems. Furthermore, a total of 86.0% of participants had a higher educational level of bachelor's or postgraduate degree. Most participants were between 20-31 years old (44.6%), single (79.5%), worked at a public hospital (65.1%), have had 10-20 years of work experience (43.9%), and have had a total bed count of >251 beds (57.2%). Except for education, there were significantly different in levels of anxiety in all sociodemographic variables (all p<0.05).

Table 1. Comparison of participants' sociodemographic characteristics and intention to leave (n = 278)

Variables	Total participants	Intention to leave	
	n (%)	Mean (SD)	*p*-value [a]
Age (years)			
<20-31	124 (44.6)	7.35 (3.06)	
31-40	53 (19.1)	8.83 (2.85)	0.001 [b]
>41	101 (36.6)	5.13 (2.31)	
Gender			
Male	134 (48.2)	5.11 (5.72)	0.001
Female	144 (51.8)	4.05 (4.43)	
Religion			
Moslem	227 (81.7)	3.68 (4.01)	<0.001
Non-moslem	51 (18.3)	4.93 (5.44)	
Education			
Diploma	39 (14.0)	6.95 (2.08)	0.720
Bachelors/postgraduate	239 (86.0)	6.81 (3.23)	
Type of hospital			
Public	181 (65.1)	5.65 (2.42)	<0.001
Private	97 (34.9)	9.03 (3.02)	
Marital status			
Single/divorced	221 (79.5)	6.62 (3.21)	0.031
Married	57 (20.5)	7.61 (2.49)	
Income (IDR)			
<4.375.479	79 (28.4)	9.34 (2.11)	<0.001
≥4.375.479	199 (71.6)	5.83 (2.85)	
Department			
Non-intensive care and emergency	226 (81.3)	7.20 (3.14)	<0.001
Intensive care and emergency	52 (18.7)	5.19 (2.22)	
Work experience (years)			
<5	79 (28.4)	7.92 (3.86)	0.002 [b]
5-9	50 (18.0)	6.56 (0.61)	
10-20	122 (43.9)	6.45 (3.29)	
≥ 20	27 (9.7)	5.81 (0.83)	
Total bed			
≤100	70 (25.5)	8.29 (2.62))	<0.001
101-250	49 (17.6)	6.12 (3.11)	
> 251	159 (57.2)	6.40 (3.09)	

Note: IDR, Indonesian Rupiah; SD, standard deviation. Data were presented as mean ± SD, frequency, and percentage, and p-values were calculated using [a] independent sample t-test and [b] one-way ANOVA. A p-value of <0.05 indicates statistical significance.

The values of the AOR and 95% CIs of perceived workload, organizational justice, and intention to leave among respondents are presented in Table 2. Perceived workload had an increased intention to leave by 0.251-fold (95% CI = 0.20 to 0.31; *p* = <0.001) after adjusting for the covariate variable. In addition, individuals with a high score of organizational justice were found to be negatively associated with intention to leave -0.144 (95% CI = -0.19 to -0.10; *p* = <0.001) after adjusting for the covariate variable.

Table 2. AOR and 95% CIs for perceived workload, organizational justice, and intention to leave among the respondents (n = 278)

Variables	Unadjusted OR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Perceived workload	0.247 (0.17 to 0.33)	<0.001	0.251 (0.20 to 0.31) *	<0.001
Organizational justice	-0.155 (-0.20 to -0.11)	<0.001	-0.144 (-0.19 to -0.10)	<0.001

Note: Adjusted beta-coefficients and 95% CIs were estimated using multiple linear regression after adjusting for age, gender, marital status, educational level, total years worked at the current hospital, work department, income, total bed count, type of hospital, and religion.

DISCUSSION

This study demonstrated that a high score of perceived workload is significantly related to a high score of intention to leave. In line with this study's findings, a previous study in Canada revealed that perceived workload is significantly correlated with escalated intention to leave among nurses (Holland et al., 2019). It is well-documented that nurses' perceptions of their workload have a negative impact on their well-being, and the retention of this workforce is becoming a significant concern. Moreover, high-involvement work practices mitigate the negative effect of heavy workloads on nurse health (Holland et al., 2019). A previous study that investigated 33,659 nurses from 488 European hospitals revealed that basic nursing tasks were neglected due to increased workload. The inability to perform fundamental nursing tasks as a vital indicator of quality patient care was also associated with lower job satisfaction and higher turnover (Kutney-Lee et al., 2013). Interestingly, according to previous studies, the nursing staff's intention to leave has been linked to long shifts of caring for patients with mental disturbances, as well as social or physical health issues (Gómez-Urquiza et al., 2017; Phillips, 2020). Moreover, a previous study in Indonesia found that workload was significantly associated with the intention to leave the profession in private hospitals in North Sumatra (Subramania, A., & Ramli, C., 2019). These findings imply that the improvement of the management of workload systems can decrease the nurses' intention to leave the profession and vice versa. In this study, the high score of perceived workload was significantly associated with the participants' intention to leave their profession.

The results of this study revealed that organizational justice is correlated with the participants' intention to leave. Our findings are consistent with a previous study conducted in six teaching hospitals in Tehran, Iran, which showed that the level of perceived organizational justice was a significant factor in influencing an employee's decision to remain in or leave a healthcare occupation. Additionally, among healthcare professionals, nurses are said to receive the least perceived organizational justice and have the highest intention to leave their current position (Zahednezhad et al., 2021). According to a study conducted by Yanchus et al. (2015) on the mental health of 11,726 health care professionals including nurses, psychiatrists, and social workers, justice was directly significantly correlated with the intention to leave their profession. This suggests that the hospital's environmental factors were associated with the organizational justice of the nursing staff and their intention to leave. From a clinical perspective, these findings may be helpful for hospitals to develop strategies for minimizing their staff's intention to leave to ensure continuity of care (Yanchus et al., 2015).

Interestingly, the empirical basis for previous studies revealed that some nursing managers could use evidence-based guidelines to develop their organization's justice environment to boost nurses' job satisfaction and retain the current nursing staff. In addition, nursing administrators must be mindful of the effects of nurses' conceptions of justice on their job happiness, intention to leave, and other outcomes, such as a decline in quality-of-care services and patient satisfaction. In this regard, a nursing manager's exclusive focus on fair human resource management may not suffice as the results and outcomes of these procedures should also be fair. In addition to seeking fair processes, nurses must also obtain equitable compensation and be treated with dignity and fairness in their interpersonal interactions (Zahednezhad et al., 2021).

Several limitations should be considered when interpreting our findings. Due to the study's cross-sectional design, participant follow-up, the estimation of the turnover rate, and its association with the desire to leave were not feasible. In addition, the data gathering instrument was a self-reported questionnaire, which may be affected by social desirability bias. Further studies should implement a larger sample size and sampling of nurses from diversified healthcare organizations to increase the generalizability of the results.

CONCLUSION AND RECOMMENDATION

It is clear from this study's findings that an increasingly demanding work environment strains the perceived organizational justice and the workforce's ability to recover among nursing at five hospitals in East Java Province, Indonesia. Therefore, management must address these issues before highly skilled nurses leave their profession. Current research suggests that nurses are more likely to consider leaving their jobs when they perceive a more significant workload and receive less organizational justice through policies and practices that replenish their resources. This research suggests that policymakers should prioritize initiatives that strengthen organizational support to enhance the well-being of nurses. As a result, management education could benefit from additional research focused on balancing these frequently competing needs of organizational justice and workload.

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ORIGINAL ARTICLE

NURSES' EXPERIENCE OF ETHICAL DILEMMA AT THE END-OF-LIFE CARE IN THE INTENSIVE CARE UNIT

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ABSTRACT

One of the aims of the care service in the Intensive Care Unit (ICU) is to prepare patients in end-of-life conditions to die in a dignified manner. This can be challenging due to decision-making problems and result in a dilemma. Therefore, this study explores the ethical dilemmas experienced by nurses that provide end-of-life care in the ICU. The qualitative phenomenological methodology was used to describe the ethical dilemmas nurses face during these conditions. The data were collected through in-depth interviews and were analyzed using Colaizzi. Purposive sampling was used to select a total of eight participants, i.e., ICU nurses, who have treated end-of-life patients. Four themes were obtained from this study, namely, "the dilemma between the family's decisions and continuing care", "patient's life expectancy and the family's hope", "DNR decisions and the nurse's confidence", and "the family's understanding of the information provided". This study recommends that the assessment of end-of-life status in critical care areas, especially the ICU, should be conducted as soon as possible to have a clearer purpose for the care provided.

Keywords: End of life; ethical dilemma; ICU; nursing

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INTRODUCTION

The Intensive Care Unit (ICU) handles critical patients due to illness, trauma, or other disease complications. The unit focuses on life or organ support that often requires intensive monitoring (Jones & Griffiths, 2014). It also aims to provide the best services to maintain the patient's life and for dying care (Fernandes & Moreira, 2012). The ICU ward is very complex because it is a life-saving area that requires health workers to apply ethics in situations that need quick decision-making (Park et al., 2015). The decision-making process could be very difficult when the patient or their family needs to decide things related to the lifesaving aspect of the patients (Span-Sluyter et al., 2018). This situation creates an ethical dilemma situation for health workers, especially nurses.

Ethical dilemmas can occur when nurses know the required actions to save the patients, but they are unable to do so due to various considerations, one of which is the socio-cultural problem of the patient's family (Holt & Convey, 2012). Moreover, the decisions taken could also conflict with the moral beliefs of the health team (Santiago & Abdool, 2011). The ethical dilemmas that often occur in the ICU ward are related to end of life care (Sorta-Bilajac et al., 2011).

End-of-life care is part of palliative care for end-of-life patients (Krau, 2016). This care service aims to improve the patient's quality of life and to prepare them to die in a dignified state (Servillo & Striano, 2008). End-of-life care for patients who have experienced critical conditions, especially for patients in the ICU room, has improved due to developments and technological advances (Vanderspank-Wright et al., 2011). Nevertheless, end-of-life care in ICU services is challenging because the ethical dilemmas faced by nurses and doctors make it difficult for them to make medical decisions (Sorta-Bilajac et al., 2011). The aspects that contribute to this condition include religious factors, beliefs, education, and language factors related to the communication used. Unfortunately, the difficulties in making these decisions also have negative effects on patients and their families (Curtis & Vincent, 2010).

The long-standing ethical dilemmas faced by nurses will also be a factor that causes mental fatigue and can interfere with their professional practice, thereby leading to suboptimal care (McAndrew et al., 2011). Moreover, issues due to ethical dilemmas can increase patient suffering and the cost of care (Wiegand et al., 2015). Therefore, this study aims to explore the ethical dilemmas experienced by nurses providing end-of-life care in the ICU.

METHOD

Study design

This is qualitative research with a phenomenological approach. Phenomenology is the study of how individuals understand their life experiences so that they can reflect on them psychologically (van Manen, 2016). This approach aims to explain the structure or essence of the life experience of someone who experienced a phenomenon by identifying the meaning and accurately describing their life experience (Maxwell & Reybold, 2015).

Participants

The participants involved in this study were eight ICU nurses who were selected by using the purposive sampling method. The sample selection was assisted by the head nurse of the ICU with the following inclusion criteria: nurses with more than two years of work experience in the ICU, a minimum education of Diploma III in nursing, can communicate and work well, and have experience caring for end-of-life patients at least twice in the last two years. After discussing the selection of participants with the ICU head nurse, the researchers made a time contract.

Data collection

The data was collected using an in-depth interview approach, and the interviews were conducted in the ICU headroom. Before conducting the interview, the researchers met the respondents to explain the plan and purpose of the research. After they agreed to participate in the interviews, the researchers made a contract of where and when the interviews will be held. The interview was conducted for approximately 40-60 minutes. The research instrument included interview guidelines and voice recording devices.

The interview began with introduction, signing of the informed consent form, and asking research questions regarding the ethical dilemmas experienced by nurses when providing end-of-life care in the ICU. The interview process was done 1-2 times for each participant, in which the first meeting explored the nurses' experiences related to the ethical dilemmas they felt when providing end-of-life care in the ICU. Meanwhile, the second meeting clarified the data that were obtained, and the participants were asked again if there were other things that they would like to add or convey. At the final stage of the study, the researchers informed the participants about the findings and conclusions. The interview and participant recruitment stopped after 8 interviews to the point of data saturation.

Data analysis

Data analysis was performed with the Colaizzi method approach. Each interview recording was transcribed. The transcriptions were then returned to the participants to be validated if there is information that the participant wants to add or remove if it does not reflect their experience. All participants agreed with each transcription. Furthermore, the encryption is read repeatedly by the researcher to find the essence of the participant's expressions and determine important statements that follow the objectives of this study. The important statements were then formulated into more general meanings and then formulated into a theme group.

Trustworthiness

In maintaining the rigor of the research and ensuring the credibility of the findings, the researchers used member checks. Reliability was achieved by maintaining the consistency of the same main questions in data collection per interview guidelines. Conformity was achieved by writing down what the participants expressed and then writing direct quotations from the transcribed data. Lastly, the researcher provided a detailed description of the research process and setting. This allows anyone interested in transferring data findings to determine whether or not such a transfer is possible (Lincoln & Guba, 1985).

Ethical considerations

This study went through several ethical consideration processes including obtaining ethical approval from the ethics committee of the Faculty of Medicine, Padjadjaran University with the ethical clearance number 201 / UN6.KEP / LC / 2019, regarding informed consent, anonymity, confidentiality, beneficence, and justice.

RESULTS

Based on the results of data analysis using the Colaizzi method approach, 4 themes were identified in this study.

The dilemma between the family's decisions and continuing care

The first theme found in this study is the existence of an ethical dilemma between the sustainability of care and family decisions. Almost all participants revealed that when a patient was treated for their end-of-life condition, families often experience dilemmas. They wish to continue the treatment, but it is constrained by the cost of care. The following is a relevant statement from a participant:

> "Perhaps the most common thing here is, for example, families have objections in funding, but actually the patient still has hope, actually in my heart it feels like something is up in my mind ..." (P 1.4)

Other participants also revealed that the family's decision will affect the continuity of further care, as shown in the following statement:

> "... but in terms of family members, they have decided to turn it off, so what we have done so far, and what we will do in the future is not optimal, ..." (P 3.2)

Other participants also expressed a similar statement:

> "... On the one hand, we know that this patient is still able to survive, and the patient's life expectancy is still there, but on the other hand the family took the decision to take the opposite action" (P.4.22)

Patient's life expectancy and their family's hope

Some participants expressed experiencing a dilemma when faced with conditions when the family no longer had any expectations regarding care for the patient, even though the patient still had a high life expectancy.

> "When it comes to making decisions, even though the patient's life expectancy is still there, the family would sometimes state to DNR (Do Not Resuscitate). So, even though we have explained the patient's progress, we will still respect the family's decision ..." (P.4.18)

Other participants also revealed that sometimes feelings of a dilemma arise when the expectations of the family differ from the life expectancy of the patient. An example would be when the patient has a low life expectancy, but the family has high expectations, as stated by a participant:

> "... for example, BSD (Brain Stem Death) patients want to maximize their family life, but the life expectancy is gone, so we like to pity the patient, so it is like we are obstructing the patient ... it's like we are torturing the patient" (P 6.16)

DNR decisions and the nurse's confidence

The next theme that emerged in this study is when nurses' beliefs conflict with the termination of care. Most participants expressed that a common dilemma that they face is related to their contrasting beliefs regarding the decision to terminate care, as expressed by one participant:

> "...On the one hand, we know that if, for example, this patient is given this procedure, he can still survive and the patient's life expectancy is still there, but on the other hand, the family makes the decision to end the treatment." (P 4.32)

Other participants also expressed a similar statement:

> "...well, we will bring that to reality. Sometimes there are families of patients who receive the term. They want their family to recover, so whatever I do, even though if you look at it medically, the patient's quality of life is low" (P 5.10)

The family's understanding of the information obtained

Several participants revealed that they would experience an ethical dilemma when explaining information related to the patient's development to their families. The information conveyed by health workers, doctors, and nurses tends to be poorly understood by the families. The participants stated their experiences in the following statements:

> "What frequently occurs is that after the patient's condition has been explained to the family by the medical team, the family will decide on the subsequent course of treatment. However, when that treatment is administered, the family frequently inquires once more to the nurse about the reason for the subsequent treatment and the procedure administered. Occasionally, after being given a further explanation, the family would refuse the action to be taken (P 7.3).

Another participant also revealed the following statement.

> "..., due to the family's lack of understanding of the information provided, sometimes when an immediate decision is needed, the family seems confused on how to behave and hamper the care provided" (P 8.4)

DISCUSSION

The dilemma between the family's decisions and continuing care

The patient's family plays the role of an advocate for their ill family members (Kydonaki et al., 2014). They also act as a guarantor of the rights of critical patients and assume responsibility for decisions related to their care and treatment (Padilla Fortunatti, 2014). The problems that arise would be related to making treatment decisions, as sometimes nurses cannot predict when the family will decide on the next treatment and how long they would need to wait until the family has made their decision (Hidayat et al., 2021). This study also found that most participants revealed that the decisions taken by the family will affect the continuity of care in patients and whether nursing actions will be continued or stopped.

In end-of-life care, the medical team sometimes has difficulty predicting the patients' length of treatment. This will in turn affect the cost of care that must be issued by the family (Selph et al., 2008). Other studies have also revealed that family decisions related to moral issues that occur in the family can sometimes help or complicate nurses in the process of further treatment follow-up (Chaves & Massarollo, 2009).

Patient's life expectancy and their family's hope

The decision-making process for DNR by the medical team could sometimes be rejected by the patient's family. This is influenced by the family's high expectations of the patient's recovery, in which the family expresses the desire that the patient can still receive maximum therapy, including CPR at the time of cardiac arrest (Amestiasih et al., 2015). The medical team must still respect all family's decisions or rejections (General Medical Council, 2014). Statements from this study's participants also revealed similar results, in which the family refused the DNR labeling despite the patient's low life expectancy.

It is often difficult for family members to make decisions on behalf of their loved ones as they may worry that their family member has suffered or that they give up too quickly, and they often harbor feelings of doubt, regret, and guilt (Adams et al., 2014). Family members who become responsible for the patient's decisions tend to also experience emotional distress related to their extended family's approval regarding the patient's death or any changes in their functional status and quality of life (Majesko et al., 2012).

DNR decisions and the nurse's confidence

The next theme is the decision to interrupt a treatment that is contrary to the nurses' beliefs. This ethical dilemma occurs when nurses face obstacles that prevent them from taking actions that are contrary to their moral beliefs (Santiago & Abdool, 2011). Such conditions could occur due to moral pressure, which could also lead the actions taken to be sub-optimal (Arianto et al., 2018). This condition is also often found when there is a treatment interruption process after the DNR decision-making process (Brizzi et al., 2012).

Caring for DNR patients is not easy, giving the DNR labels to patients can create a dilemma for nurses (Lingard et al., 2008). The dilemma can be influenced by the nurses' personal experience. It is more likely to occur in those who encounter DNR patients who eventually die during treatment. This dilemma is often felt by nurses who lack experience, knowledge, and information related to DNR. The limitations and inadequacy of DNR information affect the effectiveness of the delivery of dignified care (Piers et al., 2010).

Nurses must respect all decisions made by the family. They must act as an advocate for the patient or their family, provide correct and relevant information, and provide the best nursing care before the death process (Kon et al., 2016). The end-of-life care provided must also uphold the dignity and respect of the patient (Rosser & Walsh, 2014).

The family's understanding of the information provided

The communication dilemma felt by nurses is not only related to the attitude displayed by patients' families when dealing with them, but also to the nurses' psychological and physical

conditions. This is because when they are tired or are facing personal problems, nurses could often forget their appearance when communicating with patients' families (Arumsari et al., 2017). This condition can cause miscommunication.

Miscommunication between the family and the medical team also results in a misunderstanding of the decision-making process and consequently, the care provided to the patients (Flannery et al., 2016). Inadequate sources of information can affect the ineffectiveness of providing dignified care (National Institute for Health and Care Excellence, 2013). Communication problems in providing information related to the patient's prognosis to the family will influence the decision-making in the continuation of care. Moreover, misunderstandings occurring between the medical team and the doctor will result in treatment inconsistencies (Shorideh et al., 2012).

The limitation of this study is that during the interview the respondents could not leave the ICU ward. Hence, during the interview, they were sometimes disturbed by the activities of other nurses in the room.

CONCLUSION AND RECOMMENDATION

This study showed that there were four themes of ethical dilemmas felt by nurses working in end-of-life care in the ICU. These predicaments include the dilemma between the family's decisions and continuing care, the patient's life expectancy and their family's hope, DNR decisions and the nurse's confidence, and the family's understanding of the information provided. Each theme is interrelated as the dilemma is felt when family and medical decisions on patient care do not align with the nurses' applicable ethical values. This in turn results in the nurses' experience of moral distress. The results of this study also showed that nurses, especially those in the critical care area, experienced moral suffering because they had to take actions that do not follow their moral judgment. This results in an ethical dilemma that affects the quality of end-of-life care services provided.

Therefore, it is recommended for the hospital to form a special team to handle end-of-life cases to ensure the goals of care are achieved and ultimately improve the quality of care provided to end-of-life patients.

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ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN PSYCHOLOGICAL STRESS WITH BREASTFEEDING FREQUENCY AND BREASTMILK VOLUME DURING THE COVID-19 PANDEMIC

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ABSTRACT

Breastfeeding mothers have limited access to healthcare facilities during the pandemic, thus raising their risk of psychological stress. This study aimed to analyze the correlation between psychological stress with breastfeeding frequency and breastmilk volume. A cross-sectional survey was conducted with 120 exclusively breastfeeding mothers. The Perceived Stress Scale (PSS) was employed as a stress assessment indicator measuring tool. The measurement of breastmilk volume was performed using a manual breast pump two hours before or after the baby suckles to restore milk production. The frequency of breastfeeding was calculated by adding up the number of times the baby is breastfed in a day. The chi-square test was used in this study. It was found that 68 respondents (56.7%) reported experiencing mild to moderate stress. Stress levels were found to have a significant connection with breastfeeding frequency and breastmilk volume ($p < 0.05$). The respondents who experienced severe stress have a 2.63-times higher risk for breastfeeding <8 times/day and 33.2 times higher risk of producing breast milk <100cc than respondents who experienced mild-moderate stress. Concerns about the psychological stress of breastfeeding mothers highlight the critical need for good mental health and broader help from families during the pandemic.

Keywords: Breastfeeding; COVID-19; psychological stress

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INTRODUCTION

Breastfeeding support for mothers is the current public health priority during the COVID-19 epidemic. Many investigations have found no evidence of SARS-CoV-2 transmission through breastmilk in SARS-CoV-2 patients (Chambers C et al., 2020; Dumitriu et al., 2021; Groß R et al., 2020). Furthermore, the SARS-CoV-2 antibodies found in breastmilk have a strong immunological response to the virus. This clinical research supports global recommendations for women to continue breastfeeding during the pandemic to boost infant health and immunity (Fox et al., 2020; Pace et al., 2021; UNICEF, 2020; van Keulen et al., 2021; WHO, 2020).

From March to August 2020, the COVID-19 outbreak in Indonesia resulted in severe social restrictions and stay-at-home regulations. Since then, the incidence of SARS-Cov-2 cases has been relatively low, but then grew in the same year and the second wave of COVID-19 occurred, prompting the implementation of a policy of Enforcement of Community Activity Restrictions in May-August 2021 (John Hopkins University, 2020). For breastfeeding mothers, policies related to the pandemic in Indonesia (such as the lockdown) have resulted in a reduction in direct assistance from spouses, extended family, and professional services. These factors, in addition to financial uncertainty, can lead to psychological stress.

Furthermore, the mental health and well-being of breastfeeding mothers are a public health concern, particularly during the current pandemic conditions (Ceulemans M et al., 2020; Spatz et al., 2021; Taylor et al.,

2021). In this situation, support for new mothers' breastfeeding is severely limited, especially in terms of acquiring access and adapting to the environment during the epidemic. These conditions have caused mothers to have an excess of parental obligations, including their role in the family. Thereby contributing to why mothers are disproportionately affected by the pandemic and lockdown (Snyder & Worlton, 2021; Wenham et al., 2020).

Numerous studies have proven that the psychological state of breastfeeding mothers will decrease their breastfeeding quality (Krol & Grossmann, 2018; Shiraishi et al, 2020; Witten et al, 2020). Previous research has shown that a lack of support was noticed from the home environment's health community network. However, these studies did not explore psychological stress and its impact on breastfeeding mothers (Gonçalves-Ferri et al., 2021). Another study investigated the content of breastmilk in mothers who experienced stress during the pandemic (Juncker et al., 2022; Ziomkiewicz et al., 2021). Nevertheless, there are limited studies that have measured the effect of psychological stress on breastfeeding frequency and breastmilk volume during the pandemic. This study aimed to investigate the possible correlation between breastfeeding mothers' psychological stress to breastfeeding frequency and breastmilk volume.

METHOD

Study design

A cross-sectional study was conducted in Yogyakarta's Special Region from January to March 2021. A municipality and four district cities were selected for this investigation. Eligible participants were approached at their residences by using a list of names provided by the Public Health Care (PHCs), and convenience sampling was utilized to recruit them.

Sample

The sample size was not calculated, and a consecutive sampling method of sample selection was used. This study was comprised of a total of 120 mother-infant dyads with babies under the age of six months. Mothers who gave birth after more than a 37-week gestation period, had a baby weighing >2500 grams, had never formula fed their babies, and were impacted by the pandemic (experienced financial problems, e.g., layoffs, lower monthly wages, and lower daily earnings) were eligible for this study. The exclusion criteria included mothers who had undergone breast surgery, experienced postpartum problems, such as hemorrhagic postpartum or postpartum infection, or if the infant had neonatal abnormalities, such as labioschisis or labiopalatoschisis, or a history of admission to a neonatal critical care unit.

Instrument

Mother's age, parity type, employment status, and education level were the demographic variables assessed in this study. The Perceived Stress Scale (PSS) was employed as a stress assessment indicator measuring tool. The respondents' level of unpredictability, uncontrollability, and overburden in their lives was measured using a 10-item scale. The results obtained then measured the respondents' level of stress, from mild-moderate stress (total score 1-26) and severe stress (total score >26) (Andreou et al., 2011; Cohen & Williamson, 1988; Cohen et al., 1983; Okinarum et al., 2020) The respondents were asked how often they felt specific emotions during the COVID-19 pandemic over the previous month, with four positive words and six negative words on the list. A higher score would indicate a stressed person.

The measurement of breast milk volume was conducted by using a manual breast pump two hours before or after the baby suckles to restore the mother's milk production. Before feeding the baby, both breasts were pumped for 30 minutes or until there were no release of milk after pumping for two minutes. This pumping process were repeated three times per day, and the average was calculated. Breast milk volume was measured by using a measuring tube in cc units. The frequency of breastfeeding was calculated by adding up the number of times the baby was breastfed in a day, which could be 8 times per day or more than 8 times per day (Morton et al., 2009; Parker et al., 2015).

Data collection

All PHCs were visited in Yogyakarta to obtain data on the number of breastfeeding mothers. The mothers were then contacted to determine whether they were eligible to be respondents based on the inclusion and exclusion criteria. After confirming that they were eligible and agreed to be respondents, each respondent's house was visited to collect data.

A form was used to collect and record data on the frequency of breastfeeding for 24 hours. Due to the pandemic conditions at the time of the study, the researchers were not permitted to repeatedly contact respondents in person. Thus, the respondents were asked to complete a form for each breastfeeding session. Then, the researchers provided a standardized electric breast pump to be used by the respondents. After pumping their breasts, the respondents were instructed to take a photo of their expressed breast milk results and placed them in a measuring cup provided by the researcher. The findings were then recorded on the form.

Data analysis

Both univariate and bivariate methods were used in the data analysis project. The frequency distribution of the variables from the univariate analysis was obtained. The Chi-square test was also employed in the bivariate analysis to investigate the correlations between variables.

Ethical considerations

This study has been approved by The Research Ethics Committee, Faculty of Health Sciences, Universitas Respati Yogyakarta, Indonesia, with the number: 219.3/FIKES/PL/X/ 2020.

RESULTS

The majority of respondents in this study were primiparas, aged 20-35 years, unemployed, and have a good level of education. Based on the stress measurement conducted using PSS, it was found that a higher number of respondents experienced moderate-severe stress than mild stress. In addition, the majority of respondents breastfeed their children 8 times/day. However, regarding the volume of breastmilk, most respondents had a breastmilk volume of <100cc (Table 1). The stress experienced by the respondents has a significant relationship to the frequency of breastfeeding and their breastmilk volume (p-value < 0.05) (Table 2 and Table 3). Based on the results of the Odds Ratio (OR), the respondents who experience severe stress have a 2.613-times greater risk for breastfeeding <8 times/day (Table 2) and are 33.213 times at greater risk of producing breastmilk <100cc than respondents who have mild stress (Table 3).

Table 1. Participants' characteristics (n=120)

Variables	n	%
Age		
<20	22	18.3
20-35	70	58.3
>35	28	23.3
Parity		
Primiparous	78	65
Multiparous	42	35
Employment status		
Unemployed	76	63.3
Working	44	36.7
Educational level		
Junior high school	8	6.7
Senior high school	78	65
Diploma or above	34	28.3
Stress level		
Mild-moderate	68	56.7
Severe	52	43.3
Breastfeeding frequency		
<8 times/day	35	29.2
≥8 times/day	85	51.8
Milk Volume		
<100 cc	62	51.7
≥100 cc	58	48.3

Table 2. The relationship between stress level and breastfeeding frequency (n=120)

Variables	Breastfeeding frequency		p-value	OR	CI 95%
	<8 times/day	≥8 times/day			
	n (%)	n (%)			
Stress level					
Mild-moderate	14 (40.0)	54 (63.5)	0.031	2.613	1.165-5.860
Severe	21 (60.0)	31 (36.5)			

Table 3. The relationship between stress level and milk volume (n=120)

Variables	Milk Volume		p-value	OR	CI 95%
	<100 cc	≥100 cc			
	n (%)	n (%)			
Stress level					
Mild-moderate	15 (24.2)	53 (91.4)	0.000	33.213	11.216-98.355
Severe	47 (75.8)	5 (8.6)			

DISCUSSION

Previous studies have shown that breastfeeding mothers are more susceptible to mental illnesses (Jiang et al., 2022; Krol & Grossmann, 2018). The COVID-19 outbreak in Indonesia has exacerbated this vulnerability. While breastfeeding, mothers frequently feel a strong feeling of obligation to provide the best possible care for their infants. However, they may experience stress due to their dread of meeting new people and becoming infected with the virus and spreading it to their infants (Ceulemans et al., 2020; Vassilopoulou et al., 2021). Due to social restrictions, the COVID-19 pandemic may have had an impact on these mothers, such as their spouses losing their jobs, reduced income, and lack of aid from family members for breastfeeding. Therefore, breastfeeding women may experience stress as a result of this indirect impact (Brown & Shenker, 2021; Spatz et al., 2021).

Furthermore, previous research has shown that parity and education level have a consistent impact on stress in breastfeeding mothers (Hendaus et al., 2018; Shiraishi et al., 2020). In contrast, age has been found in multiple studies to have no meaningful link with a mother's breastfeeding behavior (Khasawneh & Khasawneh, 2017; Witten et al., 2020). Some respondents are between the ages of 20 and 35, which is the best age for giving birth and breastfeeding to lower the risk of stress. Scientific literature has indicated that a lower risk of bearing babies is seen in a maternal age of 20-30 years (Bellieni, 2016; Gossett et al., 2013).

The majority of the respondents in this research had a high school education or higher. Mothers with a higher level of education have more opportunities to learn about the benefits of breastfeeding, which increases their enthusiasm to nurse their newborns (Khasawneh & Khasawneh, 2017; Shiraishi et al., 2020).

Next, the majority of the respondents are primiparous. Compared to primiparous mothers, multipara mothers were also more likely to exclusively breastfeed since they had experience with the benefits of breastfeeding on their babies' growth and development. Furthermore, our findings support the contention that among multiparous mothers, it is the breastfeeding experience rather than the childrearing experience that influences later breastfeeding practices (Bai et al., 2015). In primiparous mothers, pressure from family and societal conventions or culture might damage the mental health of primiparous moms, leading them to opt not to breastfeed their babies (Hendaus et al., 2018; Shiraishi et al., 2020).

According to the majority of breastfeeding mothers who participated in this study, occupation can also impair the

efficiency of exclusive breastfeeding. Past studies have suggested that working mothers who breastfeed have trouble maintaining exclusive breastfeeding due to their hectic schedules and inability to bring their babies to work. Moreover, if the household does not have a maid, the duty of being a housewife exacerbates this problem as mothers would become too exhausted to breastfeed their children after doing chores (Ejie et al., 2021; Hendaus et al., 2018).

In this study, 52 people reported experiencing severe stress. Previous research has shown that COVID-19 harms the mental health of breastfeeding mothers. Breastfeeding women can face sadness and anxiety symptoms in addition to stress (Ceulemans et al., 2020). Stress on breastfeeding mothers will affect the quality of breastfeeding if it is not recognized and managed (Gila-Díaz et al., 2020).

Furthermore, the findings of this study show that there is a correlation between breastfeeding mothers' stress with the frequency of breastfeeding and the volume of breastmilk they produce. In comparison to sociocultural influences, employment, and family, breastfeeding women's psychological aspects have the greatest influence on breastfeeding patterns. Psychological factors (stress) have been shown in various nations to shorten the duration of breastfeeding (Gila-Díaz et al., 2020; Shiraishi et al., 2020). According to this study, mothers who are under a lot of stress have a greater risk of breastfeeding <8 times/day and producing breastmilk of <100 cc (average per day; three times expressing breastmilk). Breastfeeding frequency has been proven to be negatively affected by stress (Foligno et al., 2020). Although prior research has demonstrated that stress has no direct effect on decreasing breastmilk volume (Shiraishi et al., 2020), the hormone cortisol rises in response to stress in the mother. Cortisol levels under mild stress will aid the mother to adapt to and even resolve the stressor. The excessive rise of cortisol levels during moderate-to-severe stress interferes with the normal functioning of the hypothalamic-pituitary-adrenal (HPA) axis. This dysfunction will make the mother more vulnerable to physical disease and increase her risk of developing more serious mental illnesses. This will consequently jeopardize the mother's dedication to breastfeeding. Moreover, high cortisol levels in stressed nursing mothers will cause the cortisol levels in their infants to also rise (Spratt et al., 2016).

Previous research has shown that mothers who are committed to breastfeeding might lessen their stress levels (Krol & Grossmann, 2018; Mizuhata et al., 2020). The level of oxytocin in the mother's blood rises after she breastfeeds. Oxytocin is responsible for limiting the release of cortisol, which means that when a mother is breastfeeding, cortisol, as well as the mother's stress, is managed, and the amount of cortisol in the baby is reduced (Shiraishi et al., 2020). As a result, stress management in breastfeeding mothers is a critical action that needs to be conducted by mothers, families, and healthcare providers. This is because breastfeeding support increases the confidence of breastfeeding mothers and has a positive impact on achieving exclusive breastfeeding (Kartikasari et al., 2020).

The limitation of this research is this study used the same model of standardized manual breast pump, but various pumping methods were used; some only used the manual breast pump, while others also combined technique by hand. This could have an effect on the overall volume, resulting in a relatively large value in its OR.

CONCLUSION AND RECOMMENDATION

This study presents the most recent information on the influence of the COVID-19 pandemic on breastfeeding mothers' stress levels, as well as the impact on breastfeeding frequency, and breastmilk volume. During the pandemic, our data revealed a relationship between stress levels and breastfeeding frequency and breastmilk volume. Breastfeeding mothers' elevated levels of stress, which continue throughout the pandemic, can limit breastfeeding frequency and milk supply. This cross-sectional study of breastfeeding mothers during the COVID-19 pandemic found that family and community support should still be provided to reduce psychological stress to achieve exclusive breastfeeding and improve the well-being of breastfeeding mothers.

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ORIGINAL ARTICLE

THE PERSPECTIVES OF NURSES AND HIV-POSITIVE WOMEN ON A SELECTED MODEL OF PREGNANCY DECISION-MAKING PROCESSES IN NORTHEAST THAILAND

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ABSTRACT

Many women living with HIV intend to become pregnant. This is especially true for women who have received ARV treatment for a certain period. The purpose of this study was to explore the perspectives of nurses and Thai pregnant women living with HIV on pregnancy decision-making processes. This is a descriptive and qualitative study. Small group discussions were conducted with five nurses working with HIV-positive women and in-depth interviews were conducted with five Thai HIV-positive pregnant women. A model of the pregnancy decision-making process was provided to participants for the discussion. The nurses' and women's perspectives on the model can be divided into two themes: 1) The perspective of the selected model and its five sub-themes, namely: 1.1) How the substantive model reflects the pregnancy decision-making process; 1.2) Complexity; 1.3) Usability; 1.4) Strength; 1.5) Weaknesses, in addition to the perspectives of women and nurses on the application of the model. The model reflects the real-life experiences and decision-making processes of Thai women with HIV, where each category shows the trail of the women's decision-making process. However, the model is complex and requires substantial explanation. From the participant's point of view, the model reflects the barriers to the practices and services provided.

Keywords: Decision-making; developing model; pregnancy with HIV; midwives

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INTRODUCTION

Several studies gathered internationally and in Thailand have shown that many women living with HIV express the need to have a child and intend to get pregnant (Cater et al., 2013; Firth et al., 2012; Hernando et al., 2014; Huntington et al., 2013; Kownaklai & Hayter, 2022; Loutfy et al., 2012; Liamputtong & Haritavorn, 2014a). This is especially true for women who, after receiving ARV medication for a period of time, experienced improved health and returned to feeling strong as they were before infected (Rujkorakarn & Kownaklai, 2010). This has led these women to think about having sexual intimacy and intercourse with partner and to have children (Carter & Kraft, 2013; Kownaklai & Hayter, 2022).

International studies have discovered several reasons why women living with HIV intend to have a child. These reasons include them believing that their infection rate is very low, trusting anti-virus medication and medical advancement, as well as trusting their healthcare provider's information and guidance on managing their being healthy (Demissie et al., 2014; Gruskin, 2012: Rujumba et al., 2013; Thurling & Harris, 2012). Other reasons include the need to be a mother and that after becoming pregnant they could not have an abortion since it is against their religious beliefs. However, the most significant factor was shown to be the desire to have a child with a partner (Demissie et al., 2014; Hernando et al., 2014; Liamputtong & Haritavorn, 2014a). The research conducted in Thailand, it was explored that women living with HIV believe that having a child is like a blessing, they represent succession of family task, and the most significant factor was the partner's desire for a child (Kownaklai & Hayter, 2022: Liamputtong & Haritavorn,2014a). Surprisingly, many women became pregnant by hiding their HIV status from a partner

because they feared that their partner would leave them (Kownaklai et al., 2022: Liamputtong & Haritavorn, 2014b: Ross et al., 2012).

In the Thai context, currently, Thailand's standard of care for pregnant women with HIV has considerably improved. The Ministry of Health announced a policy and guidelines to prevent mother-to-child transmission for healthcare professionals across the country. These guidelines consist of providing pre-counseling and post-counseling about the HIV test for women and couple, and keeping the results strictly confidential. Pregnant women who have positive HIV results will be treated with potent ART following the standard guidelines. Infants who born to mothers with HIV positive will receive ART and artificial formula milk and will also receive a blood test for HIV infection at the age of 6, 12 and 18 months after birth. Furthermore, women, infants, and partners who contracted with HIV will receive antiretroviral treatment according to their progression of CD4 count, viral load or symptoms, as well as monitoring of their health, taking combination of ART and continuous follow-ups (Anamai, 2020; Department of Health, 2020).

In Thailand, there is no law to enforce an HIV-positive man or woman to disclose their HIV status to their partner(s) before marriage or having a child. This is unless it is related to medication/treatment or other reasons and after permission is granted from the person living with HIV. Thai pregnant women are recommended to the hospital and ANC to confirm their pregnancy and receive antenatal care. At the ANC, women will undergo an HIV screening. Once their HIV status is confirmed by staff members, they would be advised to have their partners take an HIV test. These clinic visits and advice are signals for these women to tell their partners about their HIV status– either themselves or with the support of nurses in the clinic. However, this advice is provided as a recommendation– there is no obligation for them to do so.

The authors of this study generated a pregnancy decision model in 2018 to understand how Thai women make their pregnancy decisions concerning their HIV-positive status (Kownaklai et al., 2018). This substantive model consists of six categories of factors; category 1) concealing HIV status from the partner; category 2) desire to have a child; category 3) becoming pregnant; category 4) keeping or terminating a pregnancy; category 5) accepting a decision, and category 6) adapting to a decision. The original study is found that the main concerns of women living with HIV in deciding to have a child are balancing fear as well as concealing their HIV status and the information that they have in each decision-making step. Based on the research findings, a unique process of decision-making that is related to personal and Thai social beliefs was determined.

Recommendation from this study, suggests that healthcare professional should pay greater attention to counseling women living with HIV and their partners by giving sufficient contraceptive information to prevent unplanned or unwanted pregnancies, to support and guide the women who want and plan for pregnancy in advance of this happening, and to help women deal with HIV disclosure issues related to morality and the rights of the couples. Moreover, respect and support must be provided to women living with HIV regarding their right to have a child if they choose to do so. As a result, the view of stakeholders such as nurses, midwives, and other health care professionals on this model and how it can assist them is an important topic to research.

METHOD

Study design

This qualitative study was developed from the first author's Ph. D. program which generated a substantive model on "the pregnancy decision-making processes in Thai pregnant women living with HIV". This study's main purpose was to extend this work by seeking to validate and develop the model using the perspectives of ante-natal professionals.

Research aim and question

The study aimed to explore the perspective of nurses on the model of pregnancy decision-making processes in Thai pregnant women living with HIV. The research question was how do nurses and women critique a decision-making processes model of Thai pregnant women living with HIV?

Design

Descriptive qualitative research was used to observe and engage with information-rich Thai pregnant women who are living with HIV and their nurses. They were asked to share their experiences and views about the decision-making processes among HIV-positive pregnant women and how to service them (Creswell, 2007; 2009). This type of descriptive qualitative research captured information from 10 participants as they reflected on their experiences and perceptions of a phenomenon within a Thai context.

Setting and participants

The study occurred in the antenatal care and counseling unit of a tertiary hospital in northeast Thailand from August to December 2021. The inclusion criteria to participate in the study were pregnant women who were (1) aged ≥ 18 years and considered to contract HIV before becoming pregnant, and (2) received ANC and counseling services at the study hospital at all gestational ages, (3) as well as nurse-midwives who provided service care for HIV-positive pregnant women in ANC and counseling services at the study hospital.
Purposive sampling was used to recruit participants for the study from nurse-midwives and HIV-positive women at antenatal care who met the inclusion criteria. A total of 10 participants, 5 HIV-positive pregnant women and 5 of their nurses, were recruited and was judged to reach data saturation.

Data collection

1. A total of 10 key informants were included in this study (five nurses and five HIV-positive pregnant women). The informants were interviewed, whereby data from the nurses were gathered from two small group discussions, and face-to-face in-depth interviews were conducted with the HIV-positive pregnant women.

2. A substantive model "Pregnancy decision-making process in Thai women living with HIV" (see Figure 1) was selected. The model consisted of six categories: 1) concealing their HIV-positive status from their husband; 2) their desire to have a child; 3) becoming pregnant; 4) keeping or terminating a pregnancy; 5) accepting a decision, and 6) adapting to a decision. These categories were delivered to the participants for them to share their opinion on them.

3. A flexible interview schedule was implemented. Each interview was recorded and transcribed and took approximately 45–60 minutes. The content and structure of the initial semi-structured interview guideline were developed by three experts in obstetrics and nurse-midwifery (a hospital obstetrician, an antenatal care unit nurse-midwife, and a nurse-midwife lecturer). Field notes were also written following each interview to document the researcher's ideas

(JK). These served as memos and noted significant body language and activities of the interviews.

Trustworthiness in qualitative research
The authors have advocated two elements, triangulation and member checking (Lincoln and Guba (1985:300) to strengthen trustworthiness in this qualitative study.

Triangulation
By using different sources (women, nurses, and midwives) and methods (small group discussion, in-depth interview, and observation in the setting), the investigator (JK) rechecked the contextual validation of the collected data (Lincoln & Guba, 1985; Guba & Lincoln, 1989).

Member checking
As a quality marker, one of the researchers (JK) returned to the field to meet with three participants and shared this research's findings - they confirmed the findings and provided suggestions. MH also provided critical advice in the development of the grounded theory and was involved in the writing and critical revisions of the manuscripts.

Researcher's roles and experience
JK, the first author, has been working with people and women of reproductive age living with HIV in the Northeastern region of Thailand for 10 years. JK has considerable experience in providing services in antenatal care (ANC), labor room (LR), and the postpartum period (PP). Additionally, JK is a researcher who has studied and published research papers related to pregnancy decision-making with HIV/AIDS in Thailand. Therefore, in this study, JK led the data collection, analysis, and manuscript development.

MH, the co-author, is a professor of nursing and sexual health. MH was involved in the conception and design of the study, cross-checked the data analysis, and was involved in the writing and critical revisions of the manuscript.

Data saturation
Bryant and Charmaz (2007) described that researchers would know when they have reached saturation when they hear nothing new from the data and when the categories are robust and well supported by the data. After interviewing 10 participants, the researchers were satisfied with the information collected and ceased data collection as it was clear that the categories developed were strong and well supported by the data.

Data Analysis
Thematic analysis (Braun and Clark, 2006; Vaismoradi et al., 2013) was used to analyze the collected data. The analysis was divided into six steps; 1) familiarization; reading and re-reading the transcripts, 2) coding; coding interesting data concerning the research question, 3) searching for themes; collating and gathering codes into themes, 4) reviewing themes; combining, refining, separating, or discarding entire codes, 5) defining and naming themes; defining and refining each theme and, 6) writing up the report; finally, reporting of analysis into 2 themes and 5 sub-themes.

Ethical consideration
The study was approved by the Mahasarakham University Ethics Committee for research involving human subjects (#074-377/2021). Informed consent was obtained from the participants.

RESULTS

The socio-demographic characteristics of the participants are shown in Table 1

Table 1. Participants' socio demographic characteristics n = 10

Characteristic	Number	
	Nurse-midwives	Women
Age (year)		
< 20	-	1
20-30	-	3
31-40	4	1
41-50	1	-
51-60	-	-
Religion		
Buddhist	5	5
Marital status		
Single	1	-
Married	4	5
Divorced	-	-
Widowed	-	-
Single mother	-	-
Education level		
Primary	-	-
Secondary	-	5
Vocational college	-	-
Bachelor	4	-
Master	1	-
Occupation (year)		
1-5	-	3
6-10	-	2
11-15	2	-
16-20	1	-
21-25	1	-
26-30	1	-
Duration of being HIV-positive (year)	-	4
1-5	-	1
6-10	-	-
11-15	-	-

After five HIV-positive women and five nurses and midwives were interviewed, the selected model was divided into two themes: 1) Perspective on the selected model, which contains five sub-themes, 1.1) A substantive model that reflects the pregnancy decision-making process; 1.2) Complexity; 1.3) Usefulness; 1.4) Strength; 1.5) Weakness; and 2) What is the matter? The perspective of women and nurses regarding the model's practice and services (see Table 2).

Theme 1. Perspective on the selected model

Figure 1 was provided to nurses, midwives, and pregnant women to discuss.

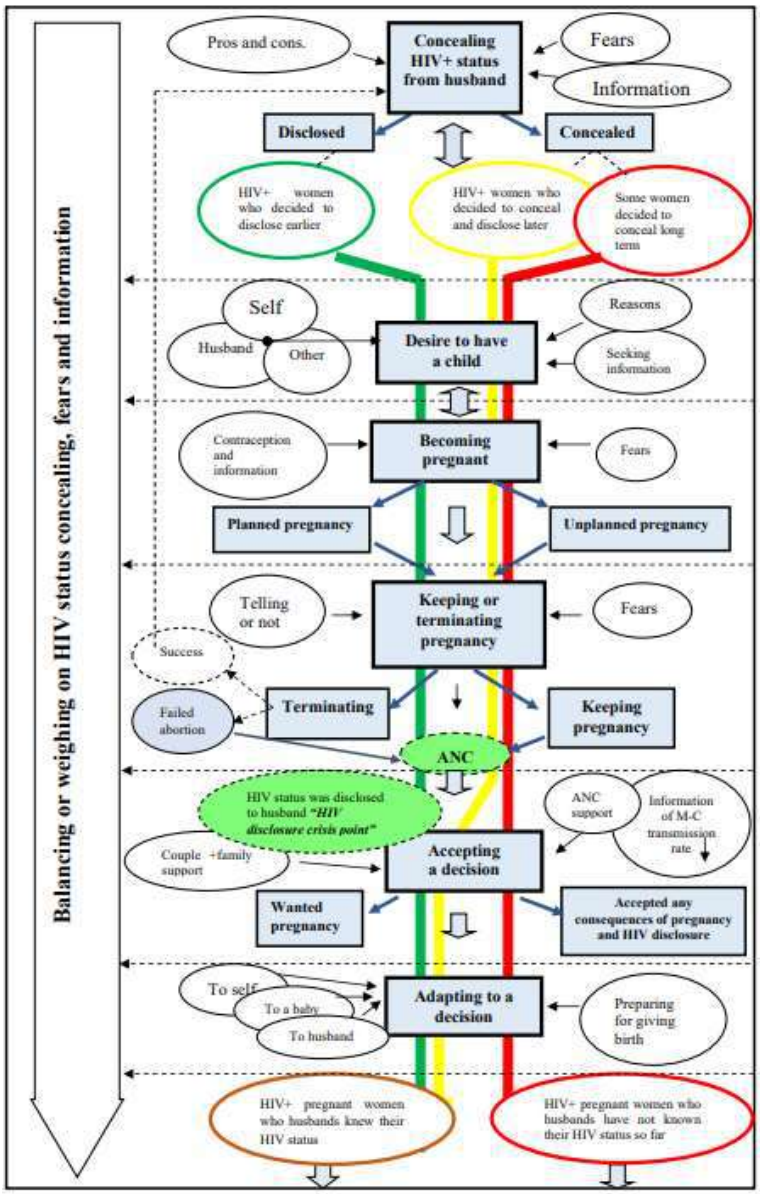

Figure 1: A substantive model developed by Kownaklai 2018

A summary of the perspectives of nurse-midwives and women based on the substantive model regarding the pregnancy decision-making process is shown in Table 2 below.

Table 2. The perspectives of nurse-midwives and women based on the substantive model regarding the pregnancy decision-making process

Sub-themes	Women's perspective	Nurses' perspective
A substantive model that reflects the pregnancy decision-making process	– They agreed on how the model reflects the experiences and decision-making processes of women. – There are options in each category that shows the footprint of each woman's decision; each category has two options. For example, concealing the infection from the partner has both disclosing and concealing options. – These options allow each woman to describe the path they took in reality.	– It is interesting at first, but it is quite difficult to follow because of its complexity. However, after the researcher explained the model, the nurses felt that the model was accurate and reasonable. – It is good to have three colors to divide the paths of the three groups of women.
Complexity	There were too many details and it was difficult to follow. The women would swipe to only look for	Complex and requires somebody to explain some points.

Sub-themes	Women's perspective	Nurses' perspective
	their own decision rather than look at the whole diagram.	
Usefulness	– Useful and can be used in practice. – Reflects the real life of the sample.	It makes nurses understand the perspectives and experiences of women more. The model helped identify how many issues were missed. The nurses agreed that the model is useful and can be used in practice with HIV-positive mothers and children.
Strength	– Matches the women's real experiences, as they agreed with the model shown.	Reflects the real-life experiences of the participants in detail.
Weakness	Difficult to follow.	Due to its complexity, it required further explanation.

Theme 2. What is the matter? The perspective of nurses and women regarding the models' practice and services

The perspective of women regarding the model's practice and services

All pregnant women stated that some healthcare providers showed some form of discrimination against HIV-infected people. Despite being impressed with the care and services of the staff of this hospital, the women wanted the nurses to add the following services:

1. To take the time to explain the treatment, medicine, and prevention of infection methods from mother to child.
2. Have nurses in the antenatal care room provide a private room for pregnancy examination. This is because, at the present ANC, the services and explanations for HIV-positive and HIV-negative pregnant women are conducted in the same room. Therefore, sometimes unrelated people may hear conversations about women's infections during the service because the examination beds are quite close together. Thus, the women suggest that the hospital should have 2-3 private rooms for counseling.
3. During the postpartum period service, women would like to have a service to deliver formula milk to their homes instead of coming to the hospital to collect it. Currently, Thailand still has a policy for infants born to HIV-infected mothers to drink formula milk instead of breastmilk. Therefore, these women must come to the hospital every *3* months to collect the formula milk for their infants. According to the respondents, going to the hospital often wastes time and travel expenses for the women and family members.

The perspective of nurse-midwives regarding the model's practice and services

Nurse-midwives at ANC

From the nurses' perspective, women receiving antenatal care services, when receiving HIV-positive results from lab 1 and lab 2, tended to hide their circumstances and HIV status, especially from their partners. According to the nurses, "Most of the time, women will tell their partners themselves." Nurses are responsible for pointing out the pros and cons of informing their partners and M-C (mother-to-child) transmission. This is because Thailand's policy has given women the right to choose whether they wish to disclose this information to their sexual partners or not.

The barriers to action

Nurses or midwives in the ANC indicated that some hospital policies breach women's confidentiality. For example, this is seen in the labeling of HIV-positive in the mother's handbook (Pink book) as well as sending the patient's relatives to collect their outpatient home medicines.

As part of Thailand's routine care and policy, the nurse or doctor would write the word "UP" (stands for Universal Precaution) at the top of the mother's handbook when they receive service at the hospital. This allows for the unintentional exposure of the women's HIV status to close relatives who are health care providers (all care providers in Thailand know what UP stands for).

> *"A woman once asked a nurse not to write the word UP (universal precaution) in the pink mother handbook for fear that others would find out, especially officials or relatives who know this abbreviation", according to the policy of the hospital they still can't do, they must write it to communicate with other staff to take care or caution"* (small group discussion, nurse group 1).

Moreover, allowing relatives to collect the patient's medicines also allows for some women's HIV status to be exposed.

> *"Most of the time, the secret is broken when the baby admitted into the ward is a sick newborn, because all children born to HIV-infected mothers are required to receive the AZT syrup. A relative is required to collect the medication from the pharmacist and medicine rooms. At this point, the relatives will see what medicine the child has received and know it's AZT"* (small group discussion, nurse group 1).

Another difficult and complex barrier is the unstoppable concealing cycle. All nurses at ANC confirmed that when these women conceal their HIV status from their partners, it would cause a new problem in a new cycle when their partners discover the truth.

> *"When women's HIV status is in the red (exposed) and their partner finds out their HIV status. Some men will leave the HIV-positive women. So, to survive, some women often have new partners and want to have another child. This will start a new cycle…"* (small group discussion, nurse group 1).

> *"We won't stop women to have a new partner, but we can protect the transmission from mother to child. Most nurse-midwives and obstetrics will recommend a permanent vasectomy for the women's partner because in the next pregnancy, they may not be so lucky again…"* (small group discussion, nurse group 1).

Nurses at the counseling clinic

The barriers to action

In this study, most nurses highlighted the importance of having a "premarital clinic" for premarital counseling. It is very important for providing advice on preventing the sexual

transmission of infectious diseases to the sexual partner and fetus. Sadly, women would get infected by their sexual partners who are unaware of their HIV status or those working in a sex trade occupation are at risk of getting infected. These barriers are supported by statements from the small group discussion, nurse group 2, as follows:

Nurses gave the opinion that premarital blood examination in Thailand is difficult to access, is a passive service, is not free, and lacks promotion to new couples. Therefore, to overcome such barriers, these services should be provided for free for voluntary couples for premarital counseling and examination.

> *"The barrier to service is the pre-marriage blood test... It is often costly and there is less publicity around it, so people pay less attention to it. These blood tests should be available for free to do before marriage or before having children"*

> *"…it is difficult to access premarital services, such as a pre-marital blood test. These types of services are given by the obstetrics clinic. Then, when the clients want to take an STD blood test and treatment, they will have to go to another medical department service since there is no STD clinic at the hospital. There are no doctors and nurses who will come to work separately here due to the heavy workload in other areas. So, there it is very not convenient for clients to wait for every service and visit many clinics just to take a premarital blood exam…"*

> *"The system is too passive, there is a lack of proactive service. The prevention of AIDS problems must be more proactive. Because when the problem comes, it is difficult and complicated to solve."*

> *"In my opinion, another barrier is the law. Our current law does not favor discordant couple counseling because this law allows one side to conceal their HIV-positive result from his or her partner. Yes, I agree that he or she should not be forced to disclose this sensitive information to others. But we should consider both points of view, his or her partner should have the right to know such information and should have the right to protect themselves too. If there is a law or act to disclose the necessary information to the partner, it will be easier for our staff to work with and have a good preparation step to deal with it"* (nurse A at the counseling clinic).

> *"I want women to open up to their partners … they don't need to tell everyone around the world but should tell their partner"… to protect themselves and their partner from the transmission and get the treatment together if they stick together, if it doesn't stick together, it's fine. You know? HIV and disclosure consulting is very difficult and requires a lot of energy from counselors because each person's life is different, it is very complex for our patients…"* (nurse B at the counseling clinic).

DISCUSSION

This study on Thai women living with HIV highlights the way that they still desire to have a child – which is also seen elsewhere in the previous literature (Hernando et al., 2014; Huntington et al., 2013: Moseholm et al., 2022). However, the severity of stigmatization in Thai society is still widespread at the family and community level, including among health service staff, as stated in other contexts and studies (Cuca et al., 2012; Kavanaugh et al., 2013; Kownaklai, 2022; Nattabi et al., 2012). In contrast, some studies indicated that some women have positive attitudes to healthcare providers and services regarding their HIV status. For example, Hanh et al. (2009) described the role of healthcare professional in supporting HIV-positive pregnant women and found that most women believed they were being supported and encouraged by healthcare providers. Similarly, Hardon et al. (2012) found that most pregnant women living with HIV (85%) in Africa felt that health providers and counselors respected their desire for confidentiality by protecting their HIV results. Moreover, Moseholm et al. (2022) indicated that HIV-positive women's interactions with healthcare providers and community influence their experiences in both positive and negative ways.

According to the opinions of the participants in this study, the selected model is quite complicated to follow. This contrasts with the view of Charmaz who proposes that a constructivist grounded model must be not too difficult to follow and understand (Charmaz, 2006). However, a grounded theory should also be comprehensive. Therefore, the current model – with its explanation – should be made to be an accurate depiction of the decision-making process of HIV-positive Thai pregnant women.

In this study, the point of view of nurses and women was that they understood why HIV-positive women may not want to share their HIV status with anyone because of their fear of stigma and its consequences. Based on the model, women should not be forced to disclose their HIV status but should be motivated to share the information by themselves with nursing support.

Nowadays, with the rapid development of HIV/AIDS treatments, especially ART, the lives and health of people who are living with HIV/AIDS have been significantly improved. However, stigma and discrimination related to living with AIDS have not decreased as much as would have been expected. HIV/AIDS-related stigma and discrimination exist among people living with HIV themselves, in families, communities, countries, and worldwide. The WHO cites that fear of stigma and discrimination are the main reasons why people are reluctant to get tested, conceal their HIV status, and take antiretroviral drugs (AIDS Education & Research Trust, 2014; Ibrahim et al., 2019; Kownaklai et al., 2022). To reduce the level of stigma and discrimination in local and international societies, people need to understand and respect other humans and their sexual rights. This must also be supported by governments and international organizations, healthcare providers, communities, and family.

The needs and choices of reproductive women who living with HIV have been changed in recent decades. Deciding to become pregnant for those women is an unavoidable situation that healthcare providers must better concern respond to by providing appropriate choices and services, managing risk among couples and infants, and respecting these women's decision to become pregnant. The challenge in taking care of reproductive-age women who are living with HIV, despite the current efficiency of treatment, is in managing more complex problems related to personal and social context such as women who live with HIV becoming pregnant, their rights and choices, and addressing the associated stigma and discrimination.

Many studies also suggest that the social-cultural context within which women living with HIV of reproductive age live and how that affects pregnancy decisions should be better understood and treated by health professionals who hope to improve their quality of life and reproductive choices (Firth et

al., 2012: Kownaklai et al., 2022; Liamputtong & Haritavorn, 2014b: Moseholm et al., 2022; Nattabi et.al., 2012).

CONCLUSION AND RECOMMENDATION

The nurses' and women's views on the model were positive. The respondents agreed that the model reflects the real-life aspects of HIV-positive women's pregnancy decisions. It also reflected the problems of the service system for HIV-infected women of reproductive age. Although they are aware of the process, women and healthcare providers still face challenges and obstacles in providing and serving women, partners, and families in the Thai context. These obstacles and problems are from the operational level to the policy level, which is complex and difficult to solve, but everyone involved in this study is hopeful that this research will improve the current conditions. Based on this study's findings, we recommend the following actions for practice, policymakers, and further research:

For practice: integrate multidisciplinary marital counseling with STD clinics as a one-stop service for better proactive service for couples, women, and families in Thailand.

For policy: well-timed law in Thailand should be considered to favor discordant couple counseling and allow one side who contracted HIV to declare their HIV status to his or her sex partner.

For further research: The model should be tested by a quantitative method with other health care professionals such as doctors. Social and well-being service members should also be included to explore their views.

This study was written based on the perspective of pregnant women and counseling nurses and midwives at the ANC. This may limit its generalizability to other settings such as the labor room, postpartum period, and other cultures and contexts.

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CONFLICT OF INTEREST

None

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ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN WAIST CIRCUMFERENCE AND WAIST-TO-HIP RATIO WITH RISK OF CARDIOVASCULAR DISEASE IN INDONESIA

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ABSTRACT

Cardiovascular disease (CVD) is one of the non-communicable diseases which is the mayor leading cause of death in the world. One of the modifiable factors of cardiovascular disease is central obesity. Assessment of central obesity status was carried out by measuring waist circumference (WC) and waist-to-hip ratio (WHR). This study aimed to determine the relationship between WC and WHR with the risk of cardiovascular disease. This was an observational study with a cross-sectional design. There were 106 respondents selected using a convenience sampling technique. In this study, the risk of cardiovascular disease was calculated using the Jakarta Cardiovascular Score. The Spearman Rho's was used as bivariate analysis for this study. The findings showed that WC and the risk of cardiovascular disease indicates a significant relationship with a moderate correlation ($p < 0.001$ and $r = 0.467$). Meanwhile, there was a significant relationship between WHR and the risk of cardiovascular disease ($p<0.001$ and $r = 0.385$). Nurse may use this study result as an evidence to develop a preventive central obesity program.

Keywords: Cardiovascular risk; waist circumference; waist-to-hip ratio

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INTRODUCTION

Cardiovascular disease (CVD) is one of the non-communicable diseases that is the most common cause of death in the world. In 2019, 16% of the total deaths worldwide or 8.9 million people were caused by coronary heart disease (World Health Organization, 2021). According to RISKESDAS 2018, the prevalence of heart disease in Indonesia was 1,017,290 case or 1.5% of the total population (Ministry of Health Republik of Indonesia, 2018). One of the risk factors for cardiovascular disease is obesity, especially central obesity (Setiadi & Halim, 2018). Central obesity cases in Indonesia always increase from 2007 to 2018 based on RISKESDAS 2018 (Ministry of Health Republik of Indonesia, 2018). Obesity is associated with complex pathophysiology. Increased availability of palatable foods and beverages, containing rich sugar or fat is supposed to be major determinant of increasing rates of obesity worldwide (Mullee et al., 2019)

Central obesity, also known as abdominal obesity, is different from general obesity because of excessive abdominal fat accumulation around the stomach and abdomen which may occur in both obese and non-obese patients (Wien, 2022). The proportion of habitual consumption of sweet foods, sweet drinks and fatty/cholesterol/fried foods more than 1 time per day in Pekalongan City is quite high compared to other areas in Central Java (Health Departement of Central Java, 2018). This habit can certainly increase the risk of obesity and cardiovascular disease in the future. Especially with the increase in obesity cases in Pekalongan City which is increased significantly in 2020 (Health Departement of Pekalongan City, 2021).

There are several anthropometric measurements of central obesity are waist circumference (WC), waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR). Waist circumference provide an overview of body fat stores, especially in the abdomen. These fats are dangerous because their proximity to the liver increases the production of free fatty acids and decreases the effectiveness of insulin (Par'i, Wiyono, & Harjatmo, 2017). In addition, fat deposits in the abdominal area have an effect on decreasing adiponectin levels (anti-inflammatory adiposity cells) and increasing pro-inflammatory cytokines which continue in metabolic complications such as cardiovascular disease (Widjaja,

Prihaningtyas, Hanindita, & Irawan, 2020). Waist circumference of more than 102 cm in men and more than 88 in women gives an illustration of the amount of fat that accumulates in the abdominal area and has more risk for diseases such as diabetes, heart disease and others (Par'i et al., 2017).

The waist-to-hip ratio (WHR) is the result of dividing the waist circumference measured at the smallest part of the abdomen horizontally with the hip circumference measured around the largest part of the buttocks. WHR values more than 0.9 for men and 0.8 for women are associated with apple shaped obesity. This body shape indicates more abdominal fat accumulation and has a higher risk of cardiovascular disease (Sudargo, Freitag, Rosiyani, & Kusmayanti, 2016).

There are inconsistencies between some previous studies regarding the correlation between waist circumference and waist-to-hip ratio with the risk of cardiovascular disease. A previous study found that waist circumference and waist-to-hip ratio have a relationship with the risk of cardiovascular disease as well as the opposite side (Bi et al., 2016; Hassan et al., 2021; Markova, Boyanov, Bakalov, & Tsakova, 2020; Rompas, Panda, & Rampengan, 2013). However, several studies revealed that the waist-to-hip ratio is stronger in determining the risk of cardiovascular disease than waist circumference and other antropometric measure (Hassan et al., 2021; Peters, Bots, & Woodward, 2018).

This study is important because central obesity is a one of modifiable risk factor for cardiovascular disease and the increasing number of obese people in Indonesia. It is necessary to conduct a study aimed to measure obesity related to cardiovascular disease risk as a preventive measure by screening the risk of cardiovascular disease. Based on previous data on differences in some studies regarding the relationship between anthropometric indicators of central obesity and the risk of cardiovascular disease and the importance of prevention by screening risk factors.

METHOD

Study Design

This is an analytic observational study with a cross sectional design conducted in the working area of the Klego Public Health Center, Pekalongan City.

Sample

A total of 106 samples were selected using a convenience sampling technique. The criteria for inclusion in this study were 25-64 years old and willing to participate in this study.

The exclusion criteria applied were individuals with a history of angina, stroke, and other heart disease, had ascites, were pregnant, could not stand properly or had to be assisted by other people or equipment and refused to participate in this study.

Instrument

The risk of cardiovascular disease in this study was measured using the Jakarta Cardiovascular Score designed by Kusmana (2002). The Jakarta Cardiovascular Score has a sensitivity of 77.9%, a specificity of 90%, a positive predictive value of 92.2% and a negative predictive value of 72.8% (Kusmana, 2002). The Jakarta Cardiovascular Score has 7 indicators that are used to assess the risk of cardiovascular disease with their scores. These 7 indicators include age, gender, blood pressure, body mass index (BMI), smoking history, history of diabetes, and level of physical activity. After the data is collected on each indicator, the Jakarta Cardiovascular Score is summed with the categories of total scores, namely low risk (score (-7) – 1), moderate risk (score 2-4) and high risk (score ≥5).

Waist circumference (WC) was measured using a metline at the smallest or midway between the lower costal margin and the iliac crest without pressing the skin (Rinaldo & Gualdi-russo, 2015). Waist circumference was categorize into normal (WC≤92 cm for men and ≤80 cm for women), increased risk (WC>92 cm for men and WC>80 cm for women), and high risk (WC > 102 cm for men and >88 for women) (Par'i et al., 2017).

The waist-to-hip ratio (WHR) measurement used the formula for dividing waist circumference by hip circumference. Hip circumference is measured using a metline around the maximum buttocks and make sure it doesn't press the skin (Rinaldo & Gualdi-russo, 2015). WHR was categorized into normal (WHR≤0.9 for men and ≤0.8 for women) and elevated (WHR >0.9 for men and >0.8 for women) (Par'i et al., 2017).

Data Collection

Data collection was carried out on April 4-16, 2022 in 2 villages which were included in the area of the Klego Public Health Center in Pekalongan City. They were Klego Village and Kauman Village. Data collection was carried out once by researchers and enumerators. Before taking measurements, the researcher explained the purpose and procedure of the study and asked for informed consent from the respondents orally and signed the written informed consent after respondent agreed to participate in this study.

Data Analysis

SPSS version 26 was used for statistical analysis, both univariate and bivariate analysis. Univariate analysis was presented by frequency and percentage of respondents' characteristics. Spearman Rho's test was conducted to determine the relationship between two variables in this study.

Ethical Consideration

This research has obtained ethical agreement from the ethics committee of the Health Polytechnic of the Ministry of Health, Semarang No. 0653 /EA /KEPK /2022.

RESULTS

A total of 106 individuals were included in analyses. Table 1 shows about education level and occupation characteristic. The majority of respondents had high school education level. In this study, the highest percentage of respondents who work as housewives. This was because the proportion of women were higher than men.

Tabel 1. Characteristics of respondents by education and occupation

Characteristics	n	%
Education		
No education	4	3,8
Elementary School	22	20,8
Junior High School	25	23,6
High School	36	34,0
Vocational High School	3	2,8
Bachelor degree	15	14,1
Master degree	1	0,9
Occupation		
Unemployed	17	16,0
Housewife	30	28,3
Worker	20	18,9
Employed	13	12,3
Teacher	4	3,8
Self employed	22	20,7

Based on table 2, this study was dominated by women, which made up 70% of the total respondents. They were also more likely to have a high risk of cardiovascular disease. The 25-34, 45-49, and 55-59 age groups had the same frequency but the number of respondents who have a high risk of cardiovascular disease in these group age increased with age. Therefore, it can be concluded that increasing age could increase the risk of cardiovascular disease. Based on blood pressure, respondents with level 1 hypertension category began to increase in the number of respondents with a high risk of cardiovascular disease. Even more than half of the respondents in this category had a high level of risk. Likewise, in the category of level 2 and level 3 hypertension, both of them also had half the number of respondents who have a high level of risk. The smoking history, more than 90% of respondents stated that they had never smoked or had stopped smoking for more than 10 years. Based on table 2, the majority of respondents do not have a history of diabetes mellitus. Respondents in this category are more likely to have a low level of risk. The majority of respondents had a low level of weekly physical activity.

Tabel 2. Characteristics of respondent by CVD risk category

Risk Factor	CVD Risk			Total
	Low n (%)	Moderate n (%)	High n (%)	
Gender				
Female	22 (20.8)	19 (17.9)	34 (32,0)	75
Male	16 (15,1)	6 (5.7)	9 (8.5)	31
Age (year)				
25-34	16 (15.1)	1 (0,9)	0 (0,0)	17
35-39	11 (10,4)	1 (0,9)	0 (0,0)	12
40-44	7 (6,6)	2 (1,9)	1 (0,9)	10
45-49	4 (3,8)	8 (7,6)	5 (4,7)	17
50-54	0 (0,0)	8 (7,6)	7 (6,6)	15
55-59	0 (0,0)	4 (3,8)	13 (12.3)	17
60-64	0 (0,0)	1 (0,9)	17 (16.0)	18
Blodd Pressure (mmHg)*				
Normal	17 (16,0)	10 (9,4)	7 (6,6)	34
High Normal	12 (11,3)	4 (3,8)	4 (3,8)	20
Grade 1 Hypertension	5 (4,7)	8 (7,6)	16 (15,1)	29
Grade 2 Hypertension	2 (1,9)	2 (1,9)	12 (11,3)	16
Grade 3 Hypertension	2 (1,9)	1 (0,9)	4 (3,8)	7
Body Mass Index (BMI)				
13,79 – 25,99	27 (25.4)	17 (16.0)	20 (18.9)	64
26,00 – 29,99	9 (8.5)	6 (5.7)	15 (14.1)	30
30,00 – 35,58	2 (1,9)	2 (1,9)	8 (7.6)	12
Smoking				
Never	38 (35.9)	24 (22.6)	40 (37.8)	102
Ex-Smoker	0 (0,0)	0 (0,0)	0 (0,0)	0
Smoker	0 (0,0)	1 (0.9)	3 (2.8)	4
History of diabetes				
No	38 (35.9%)	24 (22.6%)	37 (34.9%)	99
Yes	0 (0,0%)	1 (0.9%)	6 (5,7%)	7
Physical activity levels				
Low	24 (22,6%)	17 (16,0%)	34 (32,1%)	75
Moderate	10 (9,5%)	7 (6,6%)	9 (8,5%)	26
High	4 (3,8%)	1 (0,9%)	0 (0,0%)	5

**Normal (<135/<85), High Normal (130-139/85-89), Grade 1 Hypertension (140-159/90-99), Grade 2 Hypertension (160-179/100-109), Grade 3 Hypertension (≥180/≥110)*

According to table 3, in this study the majority of female respondents had waist circumference in the high risk category and had elevated WHR.

Tabel 3. Characteristic WC and WHR of women and men

	Women (n=75)	Men (n=31)
Waist circumference		
Low risk	10 (9,4)	21 (19,8)
Increased risk	19 (17,9)	8 (7,6)
High risk	46 (43,4)	2 (1,9)
Waist-to-hip ratio		
Normal	6 (5,7)	20 (18,9)
elevated	69 (65,0)	11 (10,4)

Based on table 4, the majority of respondents had waist circumference in the high risk category also had a high level of cardiovascular disease risk. The bivariate analysis using the Spearman Rho test showed p < 0.001 and r = 0.467. Almost half of the respondents who had excess WHR category (women ≥ 0.8 and men ≥0.9) also had a high level of cardiovascular disease risk. The Spearman Rho's test showed p<0.001 and r=0.385.

Tabel 4. Correlation WC and WHR with CVD risk

	CVD Risk			Total	Sign.	r
	Low (n=38)	Moderate (n=25)	High (n=43)			
Waist circumference						
Low risk	18 (16,9%)	6 (5,7%)	7 (6,6%)	31		
Increased risk	13 (12,3%)	8 (7,5%)	6 (5,7%)	27		
High risk	7 (6,6%)	11 (10,4%)	30 (28,3%)	48		
Total				106	<0.001	0.457
Waist-to-hip ratio						
Normal	15 (14,2%)	6 (5,7%)	5 (4.7%)	26		
Elevated	23 (21,7%)	19 (17,9%)	38 (35,8%)	80		
Total				106	<0.001	0.385

DISCUSSION

Our study found 45.3% of respondents had a waist circumference in the high risk category (women > 88 cm and men > 102 cm) and 43.5% of them were women. This shows that the incidence of central obesity in women in this study is higher than men. The high incidence of obesity could be caused by the number of women respondents being more than male and the majority of women respondents working as housewives, where there were more low activities at home. This low physical activity also encourages an imbalance calorie intake and energy expenditure so that a lot of energy is accumulated as fat, resulting in obesity (Sudargo et al., 2016).

In this study, 28.3% of respondents that had a high risk category of waist circumference also had a high risk of cardiovascular disease. The bivariate analysis using the Spearman Rho test showed that there was a significant moderate correlation between waist circumference and the risk of cardiovascular disease. This was supported by Klisić et al. (2018) which reported that WC has a significant relationship p<0.001 with strength correlation (r=0.470) on the risk of cardiovascular disease calculated using the Reynolds Risk Score (RRS). Bi et al. (2016) also stated that waist circumference has a greater correlation than other anthropometric indicators (BMI, WHR, hip circumference, body adiposity index) to cardiovascular disease risk indicators. Another study conducted by Li, Zhu, & Wang (2022) regarding the risk of death from cardiovascular disease related to waist circumference and diabetes reported that an increase in waist circumference (≥94 cm) was associated with an increase in mortality from cardiovascular disease (p<0.05) and has a hazard ratio (HR) value of 2.65.

According to Sudargo et al. (2016), an increase in waist circumference is an indicator of central obesity. A large waist circumference indicates an accumulation of excess fat in the abdominal area, especially visceral fat. Visceral fat in the abdominal area is more dangerous because its proximity to the liver increases the production of free fatty acids and fat metabolism. In addition, fat deposits in the abdominal area have an effect on decreasing adiponectin levels (anti-inflammatory adiposity cells) and increasing pro-inflammatory cytokines which continue in metabolic complications such as cardiovascular disease (Widjaja et al., 2020).

Our study found that 35.8% of respondents with elevated WHR were in the category of a high level of cardiovascular disease risk. Supported by the results of bivariate statistical data processing, there was a weak correlation between WHR and the risk of cardiovascular disease that calculated using the Jakarta Cardiovascular Score. The results of our study are in line with research conducted by (Alifiya, Indrayana, & Josafat, 2017) which reported that WHR has a significant relationship with the risk of cardiovascular disease calculated using the Framingham Risk Score on the Lombok island population with a p-value of 0.001 and a coefficient correlation of 0.390. Rahayu & Maulina (2017) also showed the results of p = 0.04 (P <0.05) which means that there was a relationship between WHR and coronary heart disease (CHD) in CHD patients at Cut Meutia Hospital.

A high WHR indicates the presence of obesity with the android type. Where in android type obesity, there is more fat accumulation in the abdomen and less fat in the hip and thighs. This type has a higher risk of diseases related to sugar and fat metabolism such as diabetes mellitus, hypertension, and cardiovascular disease (Hermawan et al., 2020; Sudargo et al., 2016).

The measurement of hip circumference itself is an anthropometric measurement that is more specific to subcutaneous fat only. Waist circumference measures the presence of visceral fat and subcutaneous fat. Thus, combining waist circumference and hip circumference measurements in a ratio allows a more specific estimate of visceral fat. In addition, the impact of gluteofemoral subcutaneous fat which can be measured by the hip

circumference is believed to provide protection against the risk of cardiovascular disease by retaining free fatty acids and preventing an increase in lipid levels (Cameron, Magliano, & Söderberg, 2013). This was also explained by Frank, De Souza Santos, Palmer, & Clegg (2019) that reported there was a protective effect of gluteofemoral subcutaneous fat on the risk of cardiovascular disease and type 2 diabetes.

In our study, the strength of correlation of WHR was lower (r=0.385) than the strength of correlation of WC(r=0.467) with risk of cardiovascular disease. This is different from several other studies which state that the WHR is superior to other anthropometric measurements as in the study by Hassan et al. (2021) regarding the relationship between anthropometric measurements of obesity (BMI, WC, WHR and waist-to-height ratio) to cardiovascular risk stated that the measurement of WHR had a stronger relationship with the risk of cardiovascular disease than measurements of BMI and WHtR with an OR value of 2.39 (95% CI: 1.92-2.98). However Hassan et al. (2021) showed no significant relationship between WC and cardiovascular disease (p value=0.109). Peters et al., (2018) also stated that WHR correlated more strongly with the incidence of myocardial infarction than BMI and WC with an HR (hazard ratio) value of 1.49 in women and 1.36 in men. This correlation was 18% stronger as a predictor of myocardial infarction in women. compared to men, which is only 6%.

This study had several limitations, including the small number of research samples, not analyzed by gender and dominated by women, while in calculating the risk of cardiovascular disease using the Jakarta Cardiovascular Score, men had a higher score. So that in future research it is recommended to balance the proportion of men and women. In addition, this study only used 2 indicators of central obesity and only used indicators of obesity as a risk factor for cardiovascular disease.

CONCLUSION AND RECOMMENDATION

Our study showed that there was a significant relationship between waist circumference and waist-to-hip ratio with the risk of cardiovascular disease. The value of the coefficient correlation of waist circumference to the risk of cardiovascular disease is higher than the coefficient correlation of the ratio of waist to hip ratio. It is recommended to Indonesia Ministry of Health to add waist-to-hip ratio measurement as an indicator for health screening in order to make cardiovascular disease risk early detection.

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