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The 2nd International Nursing and Health Sciences Symposium (INHSS)

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The 2nd International Nursing and Health Sciences Symposium (INHSS)

"Embracing Health Innovation Through Community Empowerment to Improve Patient Quality of Life"

Malang, 28–30th October 2021

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FOREWORD

The 2nd International Nursing and Health Sciences Symposium (INHSS), was successfully held in collaboration with School of Nursing and Nutrition Department, Faculty of Medicine, Universitas Brawijaya, Malang, East Java, Indonesia, at virtual conference using Zoom Apps from 28-30th October 2021. More than one-hundred participants from three countries: Indonesia, Malaysia and Taiwan gathered to discuss their contribution in making the health field a better place for both health professionals and patients. The articles contained in this Proceedings cover a wide range of topics including: nursing sciences, nutritional issues as well as other health sciences related topics. Thank you to all committee for their encouragement in preparation of these proceedings.

2nd INHSS Committe

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WELCOME MESSAGE
THE CHAIR OF ORGANIZING COMMITTEE

Assalamu'alaikum Warahmatullahi Wabarakatuh

On behalf of the 2nd INHSS committee, I would like to thank all speakers, all symposium committee, all participants, and to everyone who had contributed in many ways to ensure the success of this symposium.

The 2nd INHSS was held in collaboration with School of Nursing and Nutrition Department, Faculty of Medicine, Universitas Brawijaya, Malang, East Java, Indonesia, at virtual conference using Zoom Apps from 28-30th October 2021. The theme of this year symposium is "Embracing Health Innovation Through Community Empowerment to Improve Patient Quality of Life" with the hope that as healthcare providers we can have insight and new knowledge through evidence-based coming from this event which can be used as guidelines in providing care so that their quality of care can be improved, and to increase the capacity of School of Nursing and Nutrition Department Universitas Brawijaya more useful in the surrounding communities by applying science and health technology transfer, especially in healthcare services.

Ns. Suryanto, M.Nurs., PhD
Chair of Organizing Committee

The relationship between sugary drinks consumption and age at menarche in adolescent girls

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Abstract

Menarche is a sign that a girl is entering puberty. Currently, the occurence of menarche tends to shift to a younger age. Among genetic factors and environmental conditions, nutrition plays a major role in determining the menarche. Sugary drinks consumption is associated with metabolic changes with the potential to affect the timing of menarche. This study aimed to analyze the relationship between sugary drinks consumption and age at menarche in adolescent girls in Tangerang City. This study used an observational study with a cross sectional approach. Proportional random sampling was used to determine the sample size, consisting of 120 research subjects aged 13-15 years. Data of Sugary drinks consumption and age at menarche were collected through validated questionnaires. Data analysis used Chi Square statistical test. The results indicated that there was a relationship between sugary drinks consumption and age at menarche in adolescent girls in Tangerang City ($p < 0.05$). Sugary drinks consumption was found to be associated with earlier menarche in adolescent girls in Tangerang City.

Keywords: adolescent girls, age at menarche, sugary drinks consumption

Background

Adolescence is a period of transition from childhood into adulthood with psychological physiological changes[1]. Puberty is the first phase in an adolescent life associated with several changes, including hormonal and physical changes.[2] Adolescent girls who experience puberty are characterized by menarche. Menarche is characterized by vaginal bleeding due to the shedding of the endometrium lining of the uterus.

Currently, the occurence of menarche tends to shift to a younger age. A national survey in korea in 2001-2010 showed that the average age at menarche in Korean girls decreased from 13.4 years in 2001 to 12.4 years in 2010-2011.[3] A survey conducted by a lecturer of Faculty of Medicine at Universitas Padjadjaran stated that age at menarche for Indonesian girls during the period 1954-1963 was 15.57 years and continued to decline until 2013 with the average age at menarche of 12.28 years.[4] A systematic review predicts that the average age of menarche will decrease by 0.025 years each year.[5] Menarche in the early age is a risk factor for cardiovascular disease, insulin resistance, type 2 diabetes mellitus, hormone-related cancer.[6]

Lifestyle of adolescents is changing, one of which is a change in diets that are more dependent on risky foods.[7] Several studies discussed nutritional factors play an important role in determining puberty. A study reported that adolescents consuming sugar-sweetened beverages are at a higher risk of experiencing early menarche. Adolescent consuming soft drinks ≥1.5 times/day is 24% more potential to experience early menarche than adolescent consuming soft drinks <2 times/week.[8] High sugar intake in soft drinks may increase insulin concentration. Added sugar beverages consumption has a direct effect on the hormonal function of the female reproductive system. This study aimed to analyze the relationship between sugary drinks consumption and age at menarche in adolescent girls.

Methods

This study is an analytic observational study with a cross sectional approach, which was conducted at 3 State Junior High Schools in Tangerang City, Banten Province from June to July 2021. Population in this study were all adolescent girls aged 13-15 years who had experienced menstruation, while the sample size in this study was 120 adolescents taken using proportional random sampling. The study was conducted online using a google form due to the Covid-19 pandemic. The study subjects had previously signed an informed consent as evidence of their willingness to participate in the study. This study obtained ethical approval from the Health Research Ethics Committee of Politeknik Kesehatan Kementerian Kesehatan Jakarta II (KEPK-PKJ II) LB.02.01/I/KE/00/554/ 2021.

Data of sugary drinks consumption were obtained from filling out the Food Frequency Questionnaire (FFQ) which had been previously validated. FFQ was used to identify type and frequency of food/beverage consumption in the past month ontaining sugary drinks (carbonated drinks, energy drinks, sweet tea, sports drinks, sweet coffee, fruit-flavoured drinks). Furthermore, the FFQ was calculated using a score calculation based on Ariyanti (2018). The score was categorized as 6 for consuming foods >1 time a day, 5 for 1 time a day, 4 for 3-6 times a week, 3 for 1-2 times a week, 2 for 1-3 times a month, and 1 for never. After the coding was done, the scores were added up and the average score was calculated. The score of ≥ mean

was categorized often and the score of < mean was categorized as rare. Menarche data were obtained from a questionnaire containing the age at which the study subjects first experienced menstruation and the measurement results were categorized into early menarche for < 12 years and normal menarche for ≥ 12 years.[5] Data were analyzed using univariate descriptive analysis and presented in the form of a frequency distribution table to provide an overview of the respondent characteristics. Bivariate analysis used Chi Square test to analyze the relationship between sugary drinks consumption and age at menarche in adolescent girls.. Data analyses were performed using IBM SPSS Statistics 23 software.

Results and Discussions

Based on the result of study, data on age, sugary drinks consumption and age at menarche can be seen in Table 1. The research subjects were 120 adolescent girls aged 13-15 years in class VII-IX. Based on table 1, most of the research subjects were adolescent girls aged 14 years (45%). Based on sugary drinks consumption pattern, most of the research subjects were in the rarely consumed sugary drinks category (56.7%) and most of the research subjects had age at menarche <12 years in the early category (51.7%).

Table 2 shows that the earliest age at menarche is 9 years and the latest is 13 years with an average age of 11.37 years. Mean value of sugary drinks consumption frequency of the research subjects is 19.98, the lowest value is 14 and the highest value is 32. Analysis of the relationship of sugary drinks consumption and age at menarche is presented in table 3. Subjects who experienced early menarche are most commonly found in research subjects who frequently consume sugary drinks (67.3%). Based on the Chi-Square test, it's found that there was a significant relationship between sugary drinks consumption and age at menarche (p=0.003).

The average age at menarche in adolescent girls at Junior High Schools in Tangerang City, Indonesia was 11.37 years. A study reported that the average age at menarche in adolescent girls in Korea was 11.9 years.[9] A similar study in Bangladesh (11.6 years),[10] and China (11.97 years).[11] The results indicated that the adolescent menarche tended to shift to a younger age compared to the results of studies in previous years in Korea (12.7 years),[12] Bangladesh (13,1 years)[10] and China (12.37 years).[13] A decreasing secular trend of menarche is known to cause many health problems in women. Earlier menarche may have a greater risk of experiencing physical and psychosocial health problems, such as risky sexual behavior, cardiovascular disease, obesity, breast cancer and diabetes.[14]
Based on table 3 indicated that there was a relationship between sugary drinks consumption and age at menarche in adolescent girls (p=0.003). The results are in accordance with a cohort study in the US stating that consumption of caffeine and soft drinks was significantly associated with earlier menarche in African-American and Caucasian girls.[15] Similar study suggested that there was a relationship between consumption of soft drinks and early menarche in adolescents. Adolescents consuming soft drinks 1.5 times/day are 24% more potential to experience early menarche than those consuming soft drinks <2 times/week.[8] Recent study suggested that excessive consumption of fructose in the form of artificially sweetened fruit juices underlies the development of early menarche, insulin resistance and obesity.[16]

Sugary drinks include soft drinks, other beverages with added sugar, such as sweet tea, fruit drinks, sweet coffee, sports drinks, energy drinks and packaged drinks with

a high fructose content of corn syrup, sucrose, or fruit juice concentrates.[17] Drinks with a high glycemic index can increase the concentration of insulin in the body. Hyperinsulinemia is thought to play a mediating role in the development of precocious puberty. High insulin concentrations might affect female reproductive hormones. High estrogen levels can suppress the production of insulin-like growth factor-1 (IGF-1), which plays a key role in developing insulin resistance. In addition, decreased levels of insulin-like growth factor binding protein-1 (IGFBP-1) and sex hormone binding globulin (SHBG) associated with early menarche have also been shown to be predictors of insulin resistance.[18] According to several theories, menarche is a complex physiological process.

The relationship between more frequent consumption of sugary drinks and earlier menarche can be partly explained by the increase in BMI. However, Carwile's (2015) study reported a direct relationship of sugar-sweetened beverages consumption on early menarche using a model adjusted for BMI, it was found that BMI only explained 9.2% of the total association observed. Based on previously reported studies, BMI as an intermediate variable.[19] The limitation of this study is that this study does not include other factors that may affect menarche, such as maternal age at menarche, nutritional status, body fat percentage and socioeconomic status. Furthermore, this study cannot measure sugary drinks in terms of the portion consumed, but focuses on the frequency of consumption qualitatively.

Conclusion

This study found that there was a significant relationship between sugary drinks consumption and age at menarche, where adolescent girls who frequently consumed sugary drinks experienced menarche at an earlier age. Our findings can provide evidence to serve as a basis for supporting health education programs that emphasize healthy eating pattern as an endeavor to prevent early menarche in prepubertal girls.

Declaration Section

1. The authors declare no potential competing interests
2. This study was approved by the Jakarta II Health Research Ethics Committee (KEPK-PKJ II) LB.02.01/I/KE/00/554/2021
3. All authors contributed equally to this article. DZH conducted this research. YLRD and K as supervisors participated in reviewing the article.

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Table 1. Distribution of age, sugary drinks consumption and age at menarche

Characteristics	Total (n)	Percentage (%)
Age (years)		
13	41	34.2
14	54	45
15	25	20.8
Age at Menarche		
< 12 years (Early)	62	51.7
≥ 12 years (Normal)	58	48.3
Sugary Drinks Consumption		
Rarely	68	56.7
Frequently	52	43.3

Table 2. Average sugary drinks consumption and age at menarche

Variable	N	Min	Max	Mean	SD
Age at Menarche	120	9	13	11,37	1,028
Sugary Drinks Consumption	120	14	32	19,98	4,235

Table 3. Relationship between sugary drinks consumption and age at menarche

Variable	Menarche				P
	Early		Normal		
	N	%	n	%	
Sugary Drinks Consumption					
Rarely	27	39.7	41	60.3	0.003
Frequently	35	67.3	17	32.7	

The levels of flavonoid and anthocyanin in the ethanol extract of red rice bran

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Abstract

Red rice bran is a by-product of rice milling commonly used as an ingredient in animal. It contains bioactive components, proteins, lipids, fibers, vitamins, and minerals. Previous studies reported that there was an analysis of flavonoid and anthocyanin in unpigmented rice bran and red rice bran extract with other extraction methods. The extraction process and pigmentation influences compounds of red rice bran such as flavonoid and anthocyanin which have been reported can act as an antioxidant. This research aimed to determine the concentration of flavonoid and anthocyanin in the ethanol extract of red rice bran. The bioactive compounds were extracted from the red rice bran through maceration using ethanol. The level of flavonoid was measured by using $FeCl_3$ followed by spectrophotometry, and the level of anthocyanin was evaluated by spectrophotometry alone. The study found that the levels of flavonoid and anthocyanin in 100 g the ethanol extract of red rice bran were 456.40 mg and 340.24 mg, respectively. The results showed that the ethanol extract of red rice bran contains higher flavonoid and anthocyanin than unpigmented rice bran and red rice bran extract with other extraction methods.

Keywords: anthocyanin, ethanol extract of red rice bran, total flavonoid

Background

Indonesia is one of Asian countries with a fairly large rice productivity with a total of 55.16 million tons of rice being produced in 2020.[1,2] Rice milling involves the process of breaking the skin and grinding of rice resulting in the naked rice (the material for Indonesians' staple food) as the main product and the fine powder (known as rice bran) as the by-products.[3] Nationally, 5 million tons of the rice bran is produced annually from this process which equals to eight to ten percent of the total rice production.[4,5]

Rice bran contains various bioactive components, protein, fat, dietary fibers, vitamins and minerals. The bioactive components such as flavonoids and anthocyanins are functioning as antioxidants that have a role as antidotes to free radicals associated with acute and chronic diseases.[6–10] Flavonoids are polyphenolic compounds commonly found in plants. A type of flavonoid that is often found in plants is anthocyanin. Anthocyanins give red and purple colors to plants and are beneficial for physiological functions of the human body such as antidiabetic, cardiovascular disease prevention, anticancer and neuroprotection.[11,12] The benefit of flavonoids and anthocyanins on human health become the basis for exploring plants or foods which contain these compounds. A potential food that has these compounds is red rice bran.

The bioactive components in red rice bran can be increased by extraction because this method can attract or separate several compounds by using special solvents.[13] Extraction methods that are widely used for solid samples into the solvent include maceration, percolation and soxhletation. Maceration is the simplest method and is used in the extraction of red rice bran. Flavonoids can dissolve in polar solvents such as acetone, ethanol, methanol, and others.[14] Ethanol solvent is appropriate to use in this extraction process because extraction on the similarity level of polarity to the red rice bran compounds and low toxicity.[13,15]

So far there has been no research analyzing the compounds of red rice bran from local varieties of Magelang which have the potential to contain flavonoids and anthocyanins. Research on the content of these compounds can be empirical evidence of red rice bran extract and can be used for health benefits.[6] Based on this background, this research aims to determine the total flavonoids and anthocyanins in ethanol extract of red rice bran as a preliminary study for the basis before the experiment to see the potential benefits for prevention or disease healing.

Methods

This study used red rice bran (organic & food grade) obtained from PT Bakti Indonesia, Magelang Regency, Central Java, Indonesia and cultivated in the local area. The extraction of the red rice bran and the evaluation of its flavonoids component were carried out at the Center for Food and Nutrition Studies, Universitas Gadjah Mada (UGM), whereas the evaluation of anthocyanin level was performed at the Chemical Laboratorium, Universitas Muhammadiyah Malang (UMM).

Instrument and material

The instruments used in this research are analytical balance, glass apparatus, test tube, UV-Vis spectrophotometer, shaker, Whatman filter paper no. 1 and rotatory evaporator. The main ingredients, chemical compound and reagent used in the

production of red rice bran extract include, red rice bran (organic and food grade), 96% ethanol, 95% ethanol, $FeCl_3$ solution and HCl.

Extraction of the red rice bran

Food grade organic red rice bran was soaked in 96% ethanol solution with a ratio 1 g bran: 6 ml ethanol for 7 days and stirred regularly using a shaker at the speed of 150 rpm at room temperature. Following the soaking process, the rice bran was squeezed, and the juice was filtered by using Whatman filter paper number one. Then the filtrate was made more concentrated used by using a rotatory evaporator (30˚C) and the ethanol extract of red rice bran was obtained.[7]

Evaluation of the total flavonoid content

About 1-2 g of the red rice bran extract was weighed and then put in a test tube and then put in a test tube. Following this, 10 ml of 96% ethanol was poured into the tube. A total of 1 ml of the solution was moved into another tube, and a red color will be formed in this second tube following the addition of 5 ml of $FeCl_3$ solution. Following this, the solution was diluted to 10 ml by using 96% ethanol. Lastly, the total flavonoid was measured by using a spectrophotometer at 520 nM wavelength.

Evaluation of the total anthocyanin

A total of 2 ml of the red rice bran extract is dissolved into 100 ml with a mixture of 95% ethanol and 1.5 N HCl (85:15, v/v). Following this, the level of anthocyanin was measured by using a spectrophotometer at 535 nM wavelength. The level of of anthocyanin within the sample was calculated using this formula:

$$\text{Anthocyanin content (mg/100 g)} = \frac{\text{the absorbance x dilution factor}}{98{,}2}$$

Results and Discussions

Red rice bran, a by-product of milling a process of skin breaking and grinding of red rice, is often wasted or used in animal feed. The red rice bran used in this study was food-grade standard and was extracted using the maceration method with an ethanol solvent to obtain the extract that becomes the sample of this research. The maceration method is a cold extraction method that does not require heating during the process. By using maceration method, flavonoid and anthocyanin compounds that are heat sensitive will be protected from being damaged or decomposed.[16,17] This method is carried out by immersing and stirring the sample in a suitable solvent to obtain the compounds.[13] The ethanol solvent was used in this study to extract the bioactive components of red rice bran because ethanol is non-toxic, has good extractability, and prevents partial or total hydrolysis of stronger flavonoid and anthocyanin compounds.[18] The maceration yielded 3.8% of condensed extract of red rice bran with deep red color.

Flavonoids are secondary plant metabolites found in red rice bran extract and have antioxidants, anti-inflammatory, anticancer, antibacterial, and antiviral effects.[19] Flavonoids also act as antidiabetic because they can inhibit glucose transporters thereby blocking glucose absorption.[20] In this study, FeCl solution and a UV-Vis spectrophotometer was used to measure the level of flavonoid in the red rice bran extract. The principle of using this measurement is that flavonoids contain a conjugated aromatic which show strong absorption bands in the ultraviolet and

visible spectrum regions.[21] The flavonoid content of the red rice bran extract was measured at a wavelength of 520 nM and the results are presented in Table 1.

Our study found that the flavonoid in the red rice bran extract is 4.56 mg/g, which is higher than that found in the white, light brown and brown rice bran. Previous studies reported that there are less than 4 mg of flavonoids in each gram of white rice, light brown and brown rice bran.[22,23] The different levels of flavonoids are attributed to the pigmentation of the bran which the effect of bran color on the flavonoid content of unpigmented rice varieties is lower than that of pigmented rice varieties. [24] The use of solution during maceration process also affects the level of flavonoids in the rice bran extracts. It has been reported, that the use of ethanol solution produces higher flavonoids compared to methanol.[22]

Flavonoid are divided into certain subclasses, one of which is anthocyanins. Anthocyanins are polyphenolic pigments belonging to the flavonoid group contributing to the red-orange and blue-purple colors of plant parts.[11] In the pericarp layer of the red-pigmented rice bran, several anthocyanin compounds are accumulated .[6,25] The level of anthocyanin in the ethanol extract of red rice bran is measured by using spectrophotometer that measures the purple color absorbance of anthocyanins in ethanol solvent at a wavelength of 535 nM.[26]

Table 2 presents the total anthocyanins in 100 g ethanol extract of red rice bran. The level of anthocyanin in red rice bran extract is difference to that in light-colored rice bran extracts and can be seen physically in each color of the bran. The dark red color of ethanol extract of red rice bran indicates a high concentration of anthocyanins. This is in line with previous study who state that the level of anthocyanin in rice bran depends on the color of the grain (black, red, pink, purple, blue).[27] Previous studies reported that the level of anthocyanin in white, light brown and brown rice bran extract is 0.03 mg KE/g, 0.03 mg KE/g and 0.14 mg KE/g, respectively.[18,22,23] Other studies reported that the levels of anthocyanin red rice bran extract are 171 mg/100 g, 42 mg/100 g and 109.33 mg/100g.[23,28] Those reports indicate that the anthocyanin content is lower than that in the red rice bran extract of local varieties in Magelang. The difference is thought to be due to rice varieties, locations and extraction methods because previous studies reported that there are different levels of anthocyanin obtained from different varieties of rice bran and came from Texas and Bali.[23,28] Another difference is the type of solvent the research other red rice bran extract uses hexane and 70% ethanol.[23] In line with previous research stating that the type and concentration of solvent had a very significant effect on the total anthocyanin of rice bran. Ethanol solvent with a concentration of 96% can bind anthocyanin and flavonoid compounds compared to 70% ethanol, methanol and aqua DM.[18] In previous studies, the maceration time is also different, namely 36 hours. It is reported that the longer of the maceration time, the higher the total anthocyanin.[28] Several other factors which can affect the bioactive compounds include harvest time, storage conditions, degree of milling, husk contamination, extraction method and duration of maceration.[6,24,28,29]

Previous studies reported that flavonoids and anthocyanins pose benefits to human health such as antioxidants, anti-inflammatory, anticancer, antibacterial, antiviral, antidiabetic, neuroprotection, chemoprevention, cancer protection and cardiovascular protection.[11,19] The results of compound analysis of red rice bran extract showed the presence of flavonoids and anthocyanins which were higher than light-colored rice bran. Therefore, for the sustainability of the potential use of

ethanol extract of red rice bran in the prevention or diet therapy of a disease, it is necessary to conduct preclinical research and determine the right dose.

Conclusion

There are 456.403 mg of flavonoids and 340.24 mg of anthocyanins in 100 g of the ethanol extract of red rice bran. The levels of flavonoids and anthocyanin in particular samples depend on the method of extraction and the pigmentation of rice bran. Extraction used maceration method with 96% ethanol can bind also produces flavonoid and anthocyanin compounds maximally. The presence of red pigment in red rice bran extract contributed to the high flavonoid and anthocyanin compared to the unpigmented or light-colored rice bran extract.

Declaration Section

The authors declare no conflict of interest. The authors agree to publication this research paper for academic purposes and were willing to submit all relevant data and materials. This study was funded by personal funds. The author of this study would like to thank to Yuli Yanto and Sriyono (Center for Food and Nutrition Studies Laboratory, Universitas Gadjah Mada (UGM)) and M. Ariesandy (Universitas Muhammadiyah Malang) who helped the authors collecting data. All authors contributed equally to this manuscript. DN conducted this study and writing the manuscript, BW and TNS as supervisors who have taken the time to provide guidance during the study and contributed to the writing of the manuscript. All authors have read and approved the final manuscript. The authors approve all materials (text and tables) for publication and original publication has been correctly referenced.

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Table 1. Total flavonoid in ethanol extract of red rice bran

Sample	Results (mg/100 g)	Average (mg/100 g)
Red Rice Bran Extract	453.873 458.933	456.403

Table 2. Anthocyanin content in ethanol extract of red rice bran

Sample	Results (mg/100 g)	Average (mg/100 g)
Red Rice Bran Extract	345.667 334.813	340.240

Proximate and isoflavones content in edamame tempeh flour and modified edamame tempeh flour

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Abstract

Tempeh is a traditional Indonesian food made of fermented soybeans by utilizing the fungus *Rhizopus sp*. Tempeh is one of the functional foods containing high nutritional values as it is rich in protein, fat, fiber, iron, vitamin B_{12}, vitamin E, isoflavones, folic acid, and calcium. Besides ripe soybeans, edamame is probable to be an alternative for tempeh production. Edamame tempeh can increase the nutritional value, digestibility, and bioavailability of tempeh. The addition of the yeast *Saccharomyces cerevisiae* in the manufacture of tempeh potentially increases the amount of isoflavones in tempeh. The major problem with fresh tempeh is its short shelf life. Processing the tempeh into tempeh flour is one of the attempts to extend its shelf life. This study aims to analyze the levels of proximate and isoflavone in edamame tempeh flour and modified edamame tempeh flour with the addition of *Saccharomyces cerevisiae* yeast. The analysis of tempeh edamame flour and modified edamame tempeh flour include the proximate content analysis consisted of water and ash content by the gravimetric method, protein content through the Kjedahl method, fat content using the Weibull modified Soxhlet method, carbohydrate content using the by difference method, and isoflavones content using High Liquid Chromatography (HPLC) method. The results of the analysis showed that edamame tempeh flour and modified edamame tempeh flour had, respectively, 4.52% and 4.99% water content, 2.70% and 2.92% ash content, 43.98%, and 44.65% protein content, carbohydrate content of 25.33% and 25.91%, and isoflavone content of 182.43 g/g and 268.24 g/g. Conclusion**:** TEM flour had higher proximate and isoflavone contents compared to TE flour, aside from fat content. TEM flour had lower fat content than TE flour.

Keywords: fermentation, edamame, tempeh, *Saccharomyces cerevisiae*

Background

Tempeh is a traditional Indonesian food made of fermented soybeans with the help of the fungus *Rhizopus sp*.[1] This traditional food is consumed in daily diet as a substitute for meat since it contains high-quality nutrition that is beneficial for human health.[1,2] Tempeh is a food source that is rich in protein, fiber, vitamin B_{12}, isoflavones, folic acid, and calcium.[3] One of the alternative raw materials to make tempeh is edamame.[4]

Edamame has high nutritional values, namely protein, fat, fiber, calcium, iron, thiamine, riboflavin, vitamin E, and isoflavones.[5] In addition, edamame is high in essential amino acids. Edamame offers other benefits as well, including the low content of anti-nutritional substances such as phytic acid, antitrypsin, phenolics, and tannins.[6,7]

Edamame tempeh production is one of the attempts to improve its nutritional value and digestibility.[4] This method is supported by the fungus *Rhizopus oligosporus*, the primary microorganism in the fermentation process of making tempeh, which has been shown capable to reduce the anti-nutritional contents of beans.[8] Another advantage is that *R. oligosporus* can produce protease, lipase, and amylase enzymes to break down the substrates from macromolecules into simpler forms, and the activity of β-glucosidase, originated from *R. oligosporus,* can hydrolyze β-glucosides into isoflavone aglycones.[9,10] This causes the final product of fermentation to contain a high amount of isoflavone aglycones.[11] During tempeh fermentation, other microorganisms may grow as well, which as *Saccharomyces cerevisiae*. The yeast *S. cerevisiae* plays a role in increasing the availability of isoflavone aglycones. This modification process has the potential to produce tempeh with a higher content of isoflavone aglycones.[12–14]

The major shortage of tempeh lies in its fairly high-water content that caused a relatively short shelf life, and the presence of molds that continue to multiply and grow, leading to protein degradation and formation of ammonia. This occurrence accounts for the unpleasant odor.[15] One way to extend the shelf life and usability of tempeh is by processing the tempeh into flour.[16] Flour has a dry nature, thus capable of inhibiting the growth of microorganisms as well as chemical reactions. Tempeh flour has been used as a raw material for making complementary foods for breast milk and as a substitute for wheat flour in making sweet bread.[17] As part of functional food, it is necessary to know the nutritional content of edamame tempeh flour. This study aims to analyze the proximate and isoflavone contents in edamame tempeh flour (ET flour) and modified edamame tempeh flour (MET flour).

Methods

Design, Place and Time of Research

The type of the research is descriptive study. The analysis of proximate and isoflavone contents was carried out to determine the water, ash, protein, fat, carbohydrates, and isoflavones contents present in edamame tempeh flour (ET flour) and modified edamame tempeh flour (MET flour). Analysis of proximate content was performed at the Central Laboratory of Food and Nutrition Study, Gadjah Mada University while the analysis of isoflavone content was carried out at the Chemistry Laboratory, University of Muhammadiyah Malang. This research was conducted in June-July 2021.

Equipment and Materials

The equipment used in this study consisted of digital scales, containers/basins, stoves, frying pans/pans, stirrer/spatula, strainer, polyethylene (PE) plastic, freeze dryer, and miller machine.

The ingredients needed were edamame, obtained from Pasirhalang Village, Sukaraja District, Sukabumi Regency, West Java Province, tempeh yeast "RAPRIMA" containing the fungus *Rhizopus oligosporus*, and commercially available yeast *Saccharomyces cerevisiae* "Fermipan".

Tempeh Production

The procedure of making tempeh based on preliminary study. The stages of tempeh-making included sorting and washing using running water. Edamame that has been cleaned was boiled for ± 30 minutes over medium heat. The boiling functions to facilitate the peeling of the outer skin and epidermis. After the peeling process, the edamame seeds were divided into 2 parts, washed with running water, and then soaked for ± 18 hours. Next, the edamame seeds were boiled again with the soaking water for ± 15 minutes over medium heat, then drained, cooled, and air-dried. The dried edamame was inoculated with tempeh yeast, 2g/kg edamame, while the modified edamame tempeh was mixed with the yeast *Saccharomyces cerevisiae* 3%. The ingredients were thoroughly combined until they were evenly distributed, packed using PE plastic that has been perforated, then fermented at 28°C for 36 hours.

Preparation of Tempeh Flour

Fresh tempeh aged 36 hours were thinly sliced lengthwise with the thickness of 0.1 cm, then steamed for ± 5 minutes. Next, the tempeh was coarsely grounded and frozen in the freezer. The tempeh that has been frozen was dried using freeze dryer for 24 hours. After the tempeh was dried, it was refined using a miller machine for ± 30 seconds.

Proximate Content Analysis

The analysis was performed in the laboratory of the Center for Food and Nutrition Study, Gadjah Mada University. The weight of the samples was 30 grams for both ET flour and MET flour. The proximate analysis included the determination of water and ash content by gravimetric method, protein content by Kjeldahl method, fat content by weibull modified soxhlet method, and carbohydrate content using by difference method.

Isoflavone Content Analysis

The analysis of isoflavone content was carried out at the Chemistry laboratory of the University of Muhammadiyah Malang with the sample weight of 5 grams. Isoflavone contents in ET flour and MET flour were measured using the High-Performance Liquid Chromatography (HPLC) method. The HPLC chromatogram analysis was performed by comparing the sample chromatogram to the chromatogram of the isoflavone standard, which consisted of genistin, genistein, daidzin, daidzein, glycitin, and glycitein. The total content of isoflavones in edamame and modified tempeh were determined based on the concentration of aglycone equivalent to the concentration of glycosides.[15]

Results and Discussions

Moisture Content

Table 1 shows that ET flour had a water content of 4.52%, while MET flour had a water content of 4.99%. Both variations of tempeh flour met the quality requirements of SNI 3751:2009, which states that the maximum water content in wheat flour must be 14.5 %. The water content in foodstuffs also determines the freshness and shelf life of the respective food. The high-water content will allow bacteria, yeast, and molds to proliferate, which accelerates the process of decay.[18]

Ash Content

Table 1 shows that ET flour, MET flour, and edamame flour had the ash content of 2.70%, 2.92%, 5.86% respectively.[19] Ash content is a parameter to indicate total mineral content in a food material.[20] Tempeh contains adequate macro and micro minerals, including calcium, iron, magnesium, phosphorus, and zinc. This implies that high mineral content in both types of flour could have an impact on the high ash content. In addition, the fungus *R. oligosporus* in the tempeh fermentation process can produce phytase enzymes that play a role in breaking down phytic acid (able to bind certain minerals) into phosphorus and inositol. When phytic acid breaks down, certain minerals such as calcium, zinc, magnesium, and iron are easier to be utilized by the body.[21] Therefore, the concentration of yeast has been proven to affect ash content, where the higher the concentration of yeast used, the higher the ash content produced.[22]

Protein Content

Table 1 shows the protein content of 43.98% in ET flour and 44.65% in MET flour. ET flour and MET flour have met the quality requirements according to SNI 3144:2015, which describes the minimum standard of protein content in tempeh is 15%. The major proteins found in soybeans were 7S (*β-congycinin*) and 11S (*glycinin*). Soy protein has an effect to reduce cholesterol absorption in the intestine, thereby lowering cholesterol levels in the plasma.[23]

Several studies reported that tempeh has a better nutritional value due to the enzymatic activity of tempeh yeast. Since *Rhizopus* uses amino acids as a nitrogen source for its growth process, the total amino acid content decreases but the free amino acids increase. This mechanism promotes the easy digestion of tempeh protein in the body.[24] Soy protein consisted of almost all types of amino acids but relatively low content of cysteine and methionine.[25]

Fat Content

ET flour and MET flour in this study had a fat content of 23.49% and 21.55%, respectively. MET flour had 1.94% lower fat content compared to ET flour. The fat content in fresh edamame reached 20%.[26]

Based on the Badan Standarisasi Nasional (2015), the fat content in tempeh should be at least 7%. These results indicated that both ET and MET flours had complied with the requirement of SNI 3144:2015. The fat content in edamame tempeh became one of the functional foods since soybeans have a low saturated fat content, approximately 15%, and 60% of unsaturated fat.[26]
The lower fat content in MET flour may be due to the activity of the lipase enzyme produced by yeast. The lipase enzyme functions to decompose fat from the substrate

to decrease the organic matter content during fermentation. In addition, *S. cerevisiae* yeast is able to degrade fat which was used as its energy source.[22]

Carbohydrate Content

Based on the results of the analysis on ET flour and MET flour, it was found that the carbohydrate content in ET flour was 25.33% while the carbohydrate content in MET flour was 25.91%. The addition of yeast *S. cerevisiae* did not affect the carbohydrate content of tempeh. Soybeans are low in carbohydrates which as mostly oligosaccharides. Soy carbohydrates are considered as prebiotics that have beneficial effects on the digestive system because they are capable of stimulating the growth of bacteria such as bifidobacteria.[28]

Isoflavones Content

Table 1 shows that the isoflavone content in MET flour was higher (268.24 g/g) compared to ET flour (182.43 g/g). This might happen because the yeast *Saccharomyces cerevisiae* has the ability to break down β-glucosides into aglycones, hence resulting in an increased isoflavone aglycones contents.[13] These findings were concurred with the research by Silva et al., (2018), stating that the aglycone content in *soybean meal* (SBM) fermented by *S. cerevisiae* experienced an increase. In addition, the fermentation process with the help of microorganisms could transform isoflavones in the form of β-glycosides into aglycones which are easier to be absorbed by the body.[13,30,31] Fermentation could enhance the bioavailability of isoflavones up to twofold.[32]

Soybean products are functional foods that are high in isoflavones. Isoflavones are the major flavonoids found in soybean seeds that function as antioxidants that can bind to free radicals.[33] Another role of isoflavones is to be an immunomodulator in the body's immune system.[34]

Conclusion

Based on the results of the analysis on ET flour and MET flour, the proximate and isoflavone contents in MET flour were higher than in ET flour except for the fat content. MET flour had a lower fat content than ET flour.

Declaration Section

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Table 1. Proximate contents of edamame tempeh flour and modified edamame tempeh flour

Test Parameters	Flour Type	
	ET flour	MET Flour
Moisture content (% ww)	4.52	4.99
Ash content (% dw)	2.70	2.92
Protein content (% dw)	43.98	44.65
Fat content (% dw)	23.49	21.55
Carbohydrate content (% dw)	25.33	25.91
Isoflavones content (µg/g)	182.43	268.24

ww: wet weight, dw: dry weight

Figure 1. Fresh edamame tempeh

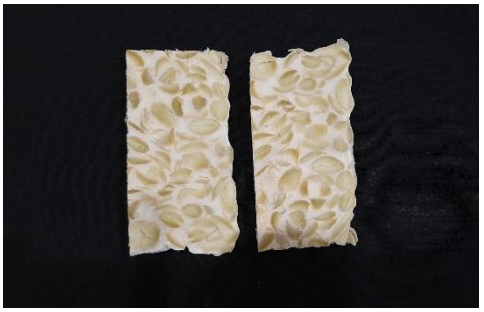

Figure 2. Fresh modified edamame tempeh

Figure 3. Edamame tempeh flour (ET Flour)

Figure 4. Modified edamame tempeh flour (MET flour)

Improving teacher's skill on early screening student's nutritional status in school

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Abstract

The high number of children with obesity was showed in almost all around the world. The role of teacher in school was needed specially to detect the nutritional status of student as an early screening on obesity preventive stage on school age children. However, the skill of teacher to assess the nutritional status was not too adequate. This study aimed to know the effect of education through small group discussion for increasing skill of teacher about nutrition status measurement. This research was used pre-experimental method to analyze the data about nutritional assessment skill of teachers. The number of respondents was 20 teachers in Palembang city —the data collected by using observation sheet about nutritional status measure phase after conducting small group discussion. The statistic result with Wilcoxon test showed improving skill number with the result p-value =0,001. Small group discussion can be one method for increasing skill the teacher about how to measure student's nutrition status so they can be documented the data to collaborate with public health center for the next intervention.

Keywords: nutritional assessment, obesity, skill, teacher

Background

Based on research that the number overweight and obese on school age children continually increases from year to year.[1] For that reason, no wonder that obesity in children has been regarded as the crisis around the world that must be overcome, not only because of the potential adverse impact on quality of life in adulthood, but also it was very injurious short-term effects to children.[2]

Based on the research that researcher conducted before that rising consumption not healthy food and low physical activity at the school or at home could be the cause of an increasing occurrence of weight.[3,4] A close connection between obesity at young age to old age it was need for the treatment and prevention which conducted as early as possible since the children. Intervention to prevent increasing the number of children weight in overweight children should be conducted before it become an obese. Some programs have been done such as counseling to masse or individual, education with some strategy and give recommendation to children who are obese with disease to health service.[5] Therefore, it is required the management and strategy for obesity in children. The comprehensive management must be implemented and involved all parties such as the individual, the environment, the relevant official and educational institutions. The role of teacher in school was needed specially to detect the nutritional status of student as an early screening on obesity preventive stage on school age children.

Based on the guidelines for prevention and implementation for obesity in school age children, one stage can be conducted especially on discovery and governance case was measure the children's anthropometry in each year through the screening health at school.[6] It was the first step to find out the first intervention if they found children with abnormal status nutrition of like malnutrition or obesity.

But the fact, many schools do not understand about the importance of this activity and not be reached by public health service, it was essential to provide understanding to the school about how important an early screening effort the nutritional status of children and support to prevent the occurrence of obesity through education to the student or give them the activity directly which is able to help reduce the occurrence of obesity.

Based on the observation that researcher conducted, there was an information from school that almost all of teacher have no skill about how to measure the nutritional status. Besides that, the public health service was not focus for providing the information about obesity or how to measurement the nutritional status. Not only that, but the children also have a bad daily activity such as playing game with their smartphone in a long time especially since Corona Virus 19 Pandemic that make them must be study from home with online learning.

There were some education methods which can use to increase skill of teacher about health information. One of them was small group discussion. The discussion which is conducted will be improve the information because the person not only reach the information but also discuss about the topic and conduct some practice with the case. The discussion was helped with guideline named Dua Sijiwa (Panduan Status Gizi Siswa) which have developed by the researcher.
Based on this background, the researcher curious to conduct the intervention trough small group discussion to improve the teacher's skill on measure nutrition status of student as an early screening phase to prevent the obesity on school age children.

The study aimed was to know the effect of small group discussion to improve the measure nutritional status skill of teacher.

Methods

The researcher exploring the information from teacher as respondents about their knowledge about how to assess nutritional status of students as a based data to develop the media in intervention. Pre-experiment with one group pre-posttest design was used to analyze the data about skill of teacher on assessing the nutritional status. Sample selection used purposive sampling. The number of respondents was 20 teachers from two school in Ilir Barat 1 sub-district, Palembang city which divided into four groups. We selected respondents by the headmaster's recommendation with inclusion criteria. The inclusion criteria for respondent were the homeroom teacher and never get information about early screening on nutritional status. The variable of this research was the nutritional assessment skill of teacher. The intervention was conducted with small group discussion and demonstration used the media which had developed before named by Dua Sijiwa (Panduan Penilaian Status Gizi Siswa) based on the collected data in the first phase. The intervention was taken once, and each intervention was conducted for thirty minutes.

Data collected by using observation sheet which filled by the researcher after the respondent demonstrated how to assess the nutritional status of student with the case that given to them. The observation sheet has been validated in one elementary school at Jakabaring sub-district. The observation questionnaire about nutritional assessment skill of teacher consists of six skills with Guttmann scales. Pretest was taken before the intervention and the post test was taken after the intervention. The research protocol for the study was approved by the Health and Medical Research Ethics Committee Faculty of Medicine, Sriwijaya University, Indonesia with protocol number 091-2021. Before the discussion and intervention, the teacher was provided with written information about the purpose of the intervention and the discussion. They were asked to inform about the study and thereafter for written consent on their behalf if they decided to participate.

Results and Discussions

The characteristic of respondent is presented in table 1. Most of the teacher in this study is a female (60%), most of them in age range 35-60 years old, and most of them have become a teacher more than 5 years. The teacher's length of work should be an opportunity for teacher to increase their knowledge and skill for measuring nutritional status of student. The teacher has a more experience to confront the student and conduct the early screening of student's nutritional status.

The nutritional assessment skill value of the respondent is presented in Table 2. The data Analysis was using Wilcoxon test. The table showed the mean number of nutritional assessment skill after the intervention was increasing from 3.05 become 5.55. The p-value number is 0.001, which showed differences after conducting the intervention through small group discussion. All of the respondents have the raising nutritional assessment skill value.

Based on the result that there were an increasing teacher's skills mean value about student's nutrition status assessment. The mean value in pretest of teacher's skill was 3.05. In the pretest data result, most teachers cannot show how to read the

anthropometry table and classified the nutritional status based on Z-score criterion. It was not a good situation when the teacher does not have a great knowledge and skill to do an early screening on nutritional status of student. Whereas, utilizing teachers as extenders may maximize the reach of Extension nutrition education programs.[7] Not only that, almost half of teachers can't determine the body mass index value. But they have a good value when determine the weight and height number of students. But there was also teacher who showed inappropriate measurement the height and weight that was not explained to take off the shoes and not to ask the student to look straight ahead.

After conducting intervention in small group discussion using media Dua Sijiwa which has been developed by researchers, the respondents have discussed how to assess the student's nutritional status started from counting the child age, determining height and weight, determining the body mass index value, determining the value of z-score and deciding the result interpreted nutritional status of students. Most teachers can assess the student's nutritional status phase by phase well. The practice with case that given in posttest can be performed and the nutritional status of students can be determined well. Primary schools contribute to promoting healthy eating behavior and preventing overweight and obesity by providing nutrition education. Research highlights the importance of improving teachers' program implementation to enhance intervention effectiveness. An integrative approach has been suggested to reduce time barriers that teachers currently experience in teaching nutrition.[8]

Simmilar with recent study that teacher has an important role in distribute knowledge and understanding to student about health information, then it would make a good result in knowledge and attitude.[9] The role of schools through teacher's skills in assessing the student's nutritional status are very important in efforts to detect nutrition status of students early especially obese student. If teachers are able to detect obese student, then teachers could give education related to how prevents obesity and work together with public health center about the next intervention for the student. Besides that, the school also can optimize the learning methods which is make students still conduct the physical activity due to online learning among the covid 19 pandemic that effect on decreasing physical activity of students.

Research shows that schools can make a positive influence on children's nutritional outcomes. The teaching of nutrition education in elementary schools by qualified teachers can make an important contribution to the knowledge and dietary habits of children.[10] The education method in this research for teacher was small group discussion also can give good impact on increasing teacher's skill. The exchange information between group members during discussion made the respondent remember about the topic fast. The guideline also helped them to find the right information if they find a different argument.
Small group discussion can increase the behavior to teacher and student in recent study. when the teacher increased the rates of opportunities to respond (OTR), the students' on-task behavior, rate of correct responses increased, and number of errors decreased.[11]

Conclusion

There was an increasing value of nutritional assessment teacher's skill after conducting small group discussion with guideline Dua Sijiwa. Discussion and

demonstration with case can be one method for increasing teacher's skill to detect the nutritional status of student

Declaration Section

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Table 1. The characteristic of respondent

Characteristic	Total (N)	Precentage (%)
Gender		
Male	4	20
Female	16	80
TOTAL	20	100%
Age		
20-35 Years	6	30
36-60 Years	14	70
TOTAL	20	100%
Length of work		
<5 years	2	10
>5 years	18	90
TOTAL	20	100%

Source: primary data

Table 2. The value nutritional assessment skill before and after intervention

	Mean	Min	Max	Ties	Positive ranks	*p*
Pre-Test	3.05	3	4	0	20	0.001
Post Test	5.55	4	6			

Source: primary data

The analysis of tocopherol contents and antioxidant activity of ethanol extract of red rice bran

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Abstract

Red rice bran is the outer layer of rice seeds that possess beneficial nutrition content and has not been utilized optimally in Indonesia. Rice bran contains antioxidants that are capable to prevent the detrimental effects of diabetes mellitus. This study aims to determine the tocopherol content and antioxidant activity of the ethanolic extract of red rice bran. Tocopherol content was determined using the High-Performance Liquid Chromatography (HPLC) method and antioxidants activity were determined using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method. The results showed that the ethanolic extract of red rice bran had the tocopherol content of 112.04 mg/100g and antioxidant activity of 60.135%. The content of tocopherol and antioxidant activity contained in rice bran extract is probable to control and prevent disease development in diabetes mellitus patients.

Keywords: rice bran, tocopherol, antioxidant activity

Background

Rice bran is the outer layer of red rice seeds comprised of pericarp, aleurone, sub-aleurone layer, and germ, which is obtained from rice processing or milling.[1] The rice milling process generates a product consisting of 70% rice, 20% husk, 8% rice bran, and 2% germ.[2]

In 2020, Indonesia is ranked the 3rd largest rice produced in the world with a total production of 54.65 million tons.[3-4] Besides that, Central Java ranks 2nd in the largest rice production in Indonesia with Magelang is one of the contributors of rice production in Central Java.[5] Magelang produces various varieties of rice, one of them is red rice with a production yield of 60-70 tons per year.[6] This massive red rice production yielded quite a lot of red rice bran production, which was 4.8-5,7 tons.

Rice bran production in Indonesia has not been utilized optimally in the food industry, even though bran is probable since it contains beneficial nutritional contents.[7] Rice bran contains antioxidant compounds, consisting of vitamin E (tocopherols, tocotrienols), phenolic compounds, anthocyanins, and γ- oryzanol.[8] The antioxidant contents in red rice bran has a conceivability to control blood glucose levels and lipid profiles, improving the status of antioxidant enzymes, and prevent the adverse effects of diabetes mellitus as well as hyperlipidemia.[9] Red rice bran also has the greatest effect in inhibiting the activity of α-glucosidase activity, which causes the suppression of postprandial hyperglycemia in DM patients, compared to brown and purple rice bran in the in vitro study.[10]

Rice bran could be developed into variegated products, one of which is herbal products obtained by extraction. The extraction method is advantageous as it can maximize the content of active compounds in the product.[11] The extraction process of the bran should carefully consider the solvents used as well since it can determine the antioxidant activity in rice bran. [12]

Ethanol solution is one of the compounds that can increase the Total Antioxidant Status.[13] Based on the results of the research on Bali red rice bran extract, ethanol 96% yields a higher value of antioxidant activity compared to aqua DM solution and is not toxic as opposed to methanol.[12]

The bioactive components of rice bran may also differ depending on the varieties and the location of cultivation land. Hence, the bran from different sources will have distinctive biological activity effects.[14] Until today, there has been no report on the content of the antioxidant activity and vitamin E (tocopherol) in the ethanol extract of red rice bran Inpari 24 grown organically in Magelang Regency, Central Java. Therefore, the purpose of this study is to determine the tocopherol content and antioxidant activity in the ethanolic extract of red rice bran.

Methods

The type of research performed was an in vitro laboratory experiment to determine the tocopherol content and antioxidant activity in the ethanolic extract of red rice bran. The tocopherol content determination was carried out at the Central Laboratory of Food and Nutrition Studies (PSPG) Universitas Gadjah Mada (UGM), while the antioxidant activity experiment was performed at the Laboratory of Food Technology and Agricultural Products Testing, Faculty of Agricultural Technology (FTP) UGM. This research was conducted in June-July 2021.

Materials and equipment

The equipment used to produce red rice bran extract were plastic containers, mesh no. 60, Whatman filter no.1, oven, shaker, measuring cylinder, rotary evaporator, and digital balance with the accuracy of 1 mg. The materials used were red rice bran and ethanol 96%.

Red rice bran ethanolic extract preparation

The rice bran was sieved using a mesh no. 60 and heated using an oven at 105 ºC for 5 minutes. The process followed by maceration process, performed using ethanol solution with the ratio of 1:6 w/v, continued by stirring process for 7 days on a shaker at 150 rpm. Next, the distillation and concentrating process were carried out using a rotary evaporator at the temperature of 30ºC.[15,16]

Determination of tocopherol content

Weigh 1 g of red rice bran extract and dissolve in 10 ml Hexane. Take 1 ml of the stock solution and heat in a water bath until only the oil remains. Add 3.5 ml of 2.2 Bipyridine 0.07% and 0.5 ml of $FeCl_3$ 0.02%, dilute to the final volume of 10 ml with 96% ethanol, measure at λ 520 nM, and create a standard curve.

Determination of antioxidant activity levels

Weigh 0.2 g of red rice bran extract and add 5 ml of methanol, vortex the mixture to extract. Take 0.3 ml of the extract and add 0.1 mM 2,2-diphenyl-1-picrylhydrazyl (DPPH) reagent. Incubate at room temperature in dark room for 1 hour. Measure the absorbance using a spectrophotometer at 515 nM. Perform blank measurement using 0.2 ml of methanol and 2.8 ml of 0.1 nM DPPH reagent with the same treatment as the sample.

Results and Discussions

Validation of analytical methods

The validation of analytical methods for calculating tocopherol content was carried out using the linearity test. The linearity test aims to ensure that the analytical method used produces accurate and reliable data.[17]

The linear regression equation obtained from absorbance versus concentration in this study yielded the standard curve Y = 0.355X + 0.002. The linear regression equation shows the correlation value (r) = 0.997. The correlation coefficient value closer to the value of 1 indicates a more linear relationship between the concentration and the area of the resulting chromatogram peak.[17] The complete results can be seen in Table 1 and Figure 1.

Tocopherol content

The analysis of vitamin E content as total tocopherol was carried out using High Performance Liquid Chromatography HPLC, while the sample preparation method was using AOAC (1988). HPLC method is a method that is commonly used to determine the content of tocopherols in food preparations, as well as the other nutrients.[18]

Based on the analysis results, the ethanolic extract of red rice bran contains the tocopherol content of 112.04 mg/100g. Vitamin E (tocopherol, tocotrienol) and oryzanol are bioactive components in rice bran that have high antioxidant potency compared to other bioactive components.[19] In bran oil products, it was also found

that the tocopherol content had a higher antioxidant effectiveness test when compared to γ-orizanol and phytosterols.[20]

Tocopherol is beneficial as a preventative and therapeutic agent for diseases caused by free radicals, which can lead to oxidative stress.[21] Oxidative stress enables the development of insulin resistance, impaired insulin secretion from pancreatic islet cells that can lead to diabetes mellitus and its pathogenesis.[22]
In diabetes mellitus patients, vitamin E functions to improve blood glucose metabolism, which subsequently reduces the risk of complications in DM patients, and is able to slow down the development of complications.[23,24] Routine administration of vitamin E supplements can also improve postprandial blood glucose levels, total cholesterol levels, and diastolic blood pressure in people with diabetes mellitus.[24]

Several studies suggested that vitamin E 100 mg/day may improve the fasting serum glucose levels, HbA1c,[25] lipid peroxides, and lipid levels in diabetes mellitus patients.[26] The dose of 100 mg/day is in accordance with the recommended daily intake of vitamin E, which ranges from 15-100 mg/day.[27] Vitamin E in red rice bran extract could be potential as food or pharmaceutical products that can control and limit the progression of the disease in DM patients.

Antioxidant Activity
The antioxidant activity in this study utilized the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method, which aims to determine the potency of red rice bran ethanol extract as an antioxidant and to observe the ability of a compound to inhibit oxidation reactions, expressed as the percentage of inhibition.[28]

Based on the analysis results, the ethanolic extract of red rice bran possesses an antioxidant activity of 60.135%. The content of antioxidant activity in rice bran is influenced by various bioactive components, namely anthocyanins, oryzanol, vitamin E (tocopherols and tocotrienols), and phenolic acids (ferulic acid, gallic acid, p-hydroxybenzoic, p-coumaric acid, protocatechuic acid and vanillic acid).[29] The ethanol extract of red rice bran also had higher antioxidant activity in several previous studies compared to white bran. The higher content of red bran is caused by the red color of the bran that contains anthocyanin pigments.[12,30]

Conclusion

Red rice bran extract has the tocopherol content of 112.04 mg/100g and antioxidant activity of 60.135%. The tocopherol content and antioxidant activity in red rice bran extract can potentially control and prevent disease development in diabetes mellitus patients.

Declaration Section

The researchers agreed to the publication of this research paper for academic purposes and were willing to submit all data and materials relevant to the research. All funding for publication were originated from personal funds. The researchers express gratitude for the support and encouragement given, to the Department of Nutrition, Postgraduate, Sebelas Maret University, Surakarta, Indonesia, the UGM PSPG laboratory, and the UGM FTP laboratory, Yogyakarta, Indonesia. All authors contributed fully to the paper preparation. The researchers have agreed to publish the text, tables, and original publications that have been properly referenced.

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Table 1. Linearity test data

Absorbance	Concentration
0.00	0.00
0.094	0.2684
0.203	0.5368
0.280	0.8052
0.397	1.0704
0.470	1.3420

Table 2. Tocopherol content of rice bran extract

Sample	Results (Mg/100g)	Average (mg/100g)
Rice Bran Extract	112,3733 111,7068	112,04005

Tabel 3. Antioxidant activity content of rice bran extract

Sample	Results (%)	Average (%)
Rice Bran Extract	60,000 60,270	60,135

Standard calibration curve of tocopherol/vitamin E

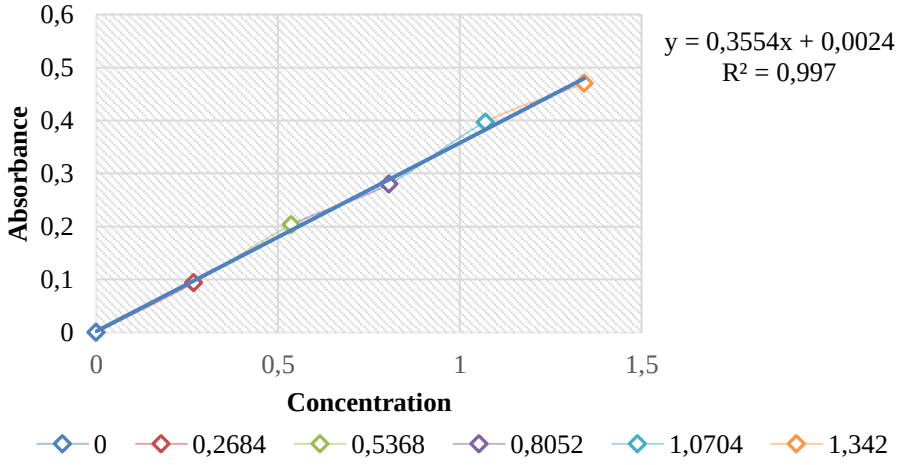

Figure 1. Tocopherol standard calibration curve

Correlation between self-awareness and compliance with the COVID-19 protocol during the period new normal at Tanjung Market, Jember Regency

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Abstract

The pandemic has Coronavirus Disease 2019 (COVID-19) triggered concern and fear for some of the world's population. The phenomenon that occurs in the community is related to non-compliance in implementing the COVID protocol in the new normal period. This greatly affects the spread of the COVID-19 virus. Many people who don't understand the spread of the COVID-19 virus, feel uncomfortable when wearing a mask and don't consistently comply with the COVID-19 protocol**.** This research aims to determine the relationship between self-awareness and compliance with the COVID-19 protocol at Tanjung Market, Jember Regency. In this study, the independent variable used was self-awareness and the dependent variable used was COVID-19 protocol compliance. This study uses a correlational design with approach cross sectional. Respondents obtained from *a* simple random sampling technique amounted to 230 people. Data were collected from self-awareness questionnaires and behavioral compliance questionnaires. The data were analyzed using the spearman rank test (α = 0.05). Based on the results of statistical tests, there is a significant relationship between self-awareness and adherence to the COVID-19 protocol with a positive correlation direction, which means that the higher self-awareness, the higher adherence to the COVID-19 protocol. People feel uncomfortable wearing masks and don't consistently apply the COVID-19 protocol which has an impact on the spread of the virus. While self-awareness is an attitude that must be owned by the community to prevent the risk of spreading the COVID-19 virus. In conclusion, this study demonstrates the importance of increasing self-awareness and consistent behavior in implementing COVID-19 compliance protocols so that people can improve their lifestyles and prevent COVID-19 disease.

Keywords: COVID-19 pandemic, self-awareness, COVID-19 protocol compliance

Background

The pandemic is Coronavirus Disease 2019 (COVID-19) now triggering concern and fear for some of the world's population.[1] The current COVID-19 pandemic has become a heartbreaking problem for all citizens of the world, including Indonesia.[2] This fear is caused by the public's perception of the COVID-19 disease whose transmission can spread rapidly.[3] Coronavirus was declared as a new type of disease that broke out in 2019 in Wuhan China, precisely in December which caused COVID-19 disease.[4] The spread of the disease that initially occurred in China then spread to almost all countries, without exception Indonesia.

The phenomenon that occurs in the community related to the COVID-19 protocol policy during this new normal is the community's disobedience in implementing the COVID-19 protocol in the period new normal, namely by ignoring the policies and rules that have been issued by the government.[5] This will greatly affect the spread of the COVID-19 virus. People are still less concerned and less aware of the rules and policies that have been made by the government.[6] During the implementation of the COVID-19 protocol, large-scale social restrictions (PSBB) were carried out which was one of the government's policies, there were still many people who did not comply with the rules of the COVID-19 protocol itself.[6]

The community's disobedience in implementing the COVID-19 protocol also occurred in the people of Jember, one of which was at the Tanjung traditional market which is the main market in Jember Regency which is a tough market and must comply with the COVID-19 protocol.[7] This is because traditional markets are one of the new clusters for the spread of COVID-19 transmission because the market is a fairly vulnerable place and is a public facility that is in direct contact with the needs of the general public. Sales transactions are carried out daily between the seller and the buyer. This is very risky for the transmission of COVID-19 disease through direct contact, either through touching when delivering goods between the seller and the buyer or payment activities using money transactions that occur between the seller and the buyer.[8]

The government issued a policy to respond to the high transmission of the virus due to COVID-19 cases which aims to reduce the increase and spread of COVID-19, namely in the form of a health protocol for handling COVID-19.[9] Policies made by the government in dealing with the COVID-19 pandemic include the policy of staying at home or not doing activities outside the home, social restrictions by avoiding crowds (social distancing), physical restrictions (physical distancing), the use of personal protective equipment (masks), applying the pattern of clean and healthy living (PHBS) by washing hands 6 steps, working from home studying and working at home and postponing all activities that gather large crowds, large-scale social restrictions (PSBB) and the implementation of policies new normal.[10] In this case, the government urges the public to obey and obey the rules and policies that have been made to break the spread of COVID-19.[10]

Community compliance in carrying out the COVID-19 protocol is seen through behavior that accepts and tries to fulfill and follow the recommendations and regulations and policies that have been issued by the government.[11] Compliance is defined as individual behavior in believing and accepting, so that they want to carry out suggestions or orders from others or carry out regulations that have been set by the government and at the same time obey them. Compliance aims to describe people's behavior in following policies that have been issued by the government.[12]

The existence of an attitude of self-awareness is one of the factors that supports the level of compliance with the COVID-19 protocol. Self-Awareness is an understanding and belief in one's abilities and limitations.[13] A person with high self-awareness is able to understand and maintain emotions for what he feels, is critical of information about himself and consciously understands about himself correctly so that he has directed behavior which means that his actions aim to be known by others and tend to always try to comply with norms. in society and make adjustments to existing norms or policies.[14] So that researchers are interested in analyzing the relationship between self-awareness and compliance with the COVID-19 protocol during the period new normal at Tanjung Market, Jember Regency.

Methods

This study uses a descriptive correlational quantitative research design using simple random sampling with the method cross sectional with the population of this study being all lower floor traders at Tanjung Market, Jember Regency. The population involved in this study were 539 traders in Tanjung Market, Jember Regency. This study used a research sample of 230 traders calculated using the Slovin formula. This study uses a probability sampling technique with simple random sampling, namely sampling with the technique of each population having an equal opportunity to be selected as a member of the sample. Sampling uses application randomized to get a random sample. Researchers took samples according to the numbering and names chosen in the application randomized by adding 10% of the specified sample by adding a number of 20 respondents to anticipate if the respondent dropped out or was not willing to become a respondent. The researcher then conveyed the aims and objectives of the research to the prospective respondents, namely the traders in the Tanjung Market, Jember Regency whose names were listed on the randomized results. Prospective respondents who are willing to become respondents are given a Self-Awareness questionnaire and a COVID-19 protocol compliance questionnaire. In the process of collecting research data, the researcher was accompanied by two staff from the Tanjung Market, Jember Regency. Researchers used personal protective equipment, namely masks and washing hands or using hand sanitizers before taking data from respondents.

Researchers visited respondents who participated in the study using simple random sampling technique which had previously been randomized using application randomized with the assistance of two research friends and accompanied by two staff from the Tanjung Market, Jember Regency. Researchers equate perceptions with research friends who help in the data search process so that they have the same perception, after getting the respondents the researchers introduce themselves and explain the aims and objectives of the research in a coherent and clear way, by explaining to the respondents that the respondents are entitled. The researcher ensures that there is no duplication of respondents or duplicate respondents by having data on the names of respondents who have become respondents before and checking the respondents who will follow so that there is no duplication. Then when the questionnaire has been completed, the completed questionnaire is collected from the researcher. Filling out the research questionnaire through a self-awareness questionnaire with a total of 36 items was declared valid with a value of r = 0.922, Cronbach alpha 0.711 and a protocol compliance behavior questionnaire, namely a behavioral questionnaire, the validity value of r counts 0.187-1> r table 0.1409 and value Cronbach's alpha 0,60. Data collection was carried out from March 24, 2021, to April 7, 2021. The data were

analyzed using the spearman rank test (α = 0.05). This research has been declared to have passed the ethical qualification through the KEPK of the Faculty of Nursing, University of Jember with No. No.28/UN25.1.14/KEPK/2021.

Results and Discussions

The characteristics of the respondents in this study consisted of 230 traders in Tanjung Market, Jember Regency, dominated by 134 men (58.3%). Educational history of traders shows that SMA/equivalent is the highest level of education, which is 98 people (42.6%). Most of the religions of the 230 traders as many as 224 people (97.4%) is Muslims. Most of the traders in Tanjung Market, Jember Regency do not have any comorbidities or congenital diseases as many as 211 people (91.7%). The variable Self Awareness of traders in Tanjung Market, Jember Regency results as much as (21.7%) have good Self Awareness, namely 50 respondents and (78.3%) have Self Awareness, sufficient which is 180 respondents. Protocol compliance variables there are as many as (52.2%) traders in Tanjung Market, Jember Regency, have high compliance, namely 120 traders and (43.5%) have sufficient compliance, namely 100 traders while (4.3%) have low compliance, namely as many as 10 traders. Most traders have high compliance, which is 120 people (52.2%).

The results of the analysis of the relationship between Self Awareness and Compliance with the COVID-19 Protocol in the Period of New Normal at Tanjung Market, Jember Regency using the test spearmen rank which obtained p value < 0.05 so it can be concluded that the alternative hypothesis (Ha) failed to be rejected or there is a relationship between Self Awareness with the compliance of the COVID-19 protocol during the period of New Normal at Tanjung Market, Jember Regency with a p value = 0.024 failed to be rejected with a correlation value (r) of 0.148 with a weak strength which means the correlation is positive, so it can be concluded that the higher the Self-Awareness, the compliance COVID-19 protocols will also be higher.

Self-awareness among traders in Tanjung Market, Jember Regency with results (21.7%) categorized as good and as many as (78.3%) categorized as sufficient. Self-awareness is related to compliance with health protocols. Individuals who are able to realize the connection between their feelings and thoughts and recognize their own behavior, individuals have awareness related to behavior that is able to make a person more introspective and more focused on work, of course, while still complying with applicable health protocols.[15] Self-awareness will not occur if a person does not have the ability to be aware or care about himself. A study conducted on 91 respondents showed that employee respondents experienced moderate anxiety with 54 people with self-awareness sufficient. While those who have self-awareness good are 17 people with low anxiety.[13] This is in line with the theory that self-awareness is an interaction between thoughts, feelings and behavior.[16] Someone who has high self-awareness is able to realize the relationship between feelings, thoughts and behavior, so the individual is able to control his mind against anxiety about the dangers that are being faced. However, with the presence of self-awareness , employee respondents in restaurants become more daring to appear with self-confidence and realize that anxiety only comes from uncontrolled thoughts.[13]

Traders who have self-awareness heightened to pay more attention to behavior in their work activities, which are more likely to comply with health protocols.[16] Self-

awareness will not occur if a person does not have the ability to be aware or care about himself. If a person has good self-awareness and is able to recognize his feelings and behavior, compliance with health protocols will always be applied in carrying out daily activities.[15] Based on research and phenomena that occur, researchers assume that self-awareness is important as a preventive or preventive measure during the current COVID-19 pandemic to avoid transmission of the COVID-19 virus. Thus, achieving self-awareness as a preventive measure against the transmission of the COVID-19 virus at this time requires an attitude of self-awareness from the traders themselves to remain aware of behavior by complying with health protocols to prevent transmission of the COVID-19 virus.[17]

The majority of traders in Tanjung Market, Jember Regency have high compliance (52.2%) with (43.5%) having sufficient compliance and (4.3%) having low compliance. This is because traders feel uncomfortable if they always wear masks while working and find it difficult to breathe. But most traders still adhere to the recommended rules. Health behavior towards COVID-19 protocol compliance is influenced by many factors, including knowledge, perception, emotion, motivation and environment). Compliance is quite closely related to behavior. The theory put forward by Lawrence Green about behavior that studies human behavior from the health side which aims to determine health problems and as a health planning tool.[18] Compliance describes positive community behavior in complying with health protocols.

A person will have an obedient attitude towards the policy if there is a belief that the policy is effective in reducing the spread of COVID-19.[10] Compliance with health protocols in dealing with the COVID-19 pandemic is one of the prevention and preventive efforts to prevent the transmission of the COVID-19 virus that occurs. This policy to always comply with the COVID-19 protocol is effective in reducing the current spread of COVID-19. Previous research conducted by [19] found that most people have good behavior (95.8%). The forms of behavior shown include compliance in using masks when outside the house, washing hands with soap or hand sanitizer frequently, avoiding crowds and maintaining social or physical distancing.

Based on the research and the phenomena that have occurred, researchers assume that compliance with the COVID-19 protocol is important to break the chain of transmission of the COVID-19 virus that is currently happening. Compliance with health protocols in dealing with the COVID-19 pandemic is one of the prevention and preventive efforts to prevent the transmission of the COVID-19 virus that occurs. This policy to always comply with the COVID-19 protocol is effective in reducing the current spread of COVID-19.[18]

The relationship between self-awareness and compliance with the COVID-19 protocol**.** In this study, it was found that the most traders' values self-awareness had sufficient. Self-awareness is the interaction between thoughts and feelings. Based on the results of the study, it was found that there was a significant relationship between self-awareness and compliance with the COVID-19 protocol on traders at Tanjung Market, Jember Regency with a correlation value of 0.148 which means that it shows a positive correlation direction with weak strength. This shows that the higher self-awareness, the compliance with the COVID-19 protocol will also be higher. The higher a person's self-awareness attitude, the more obedient in implementing health protocol policies.[19] The strength of the weak correlation in this study is probably because the instruments used in the study did not indicate in

detail and did not explain what indicators played the most important role and what indicators had to be implemented or applied to achieve high compliance, adequate compliance and low compliance.[13] moderate because it is only based on the scoring value and it is not explained whether it is on the research instrument so it cannot be ascertained the indicators that support the closeness in this study.[20]

Traders who comply with health protocols can occur because they have awareness of the importance of complying with the COVID-19 protocol that has been recommended by the government, and realize that the behavior taken as an effort to prevent the transmission of the COVID-19 virus that is happening at this time is being done for their own good.[20] If a person does not comply with the recommended health protocols, and does not have self-awareness of himself, this can put the person at risk for contracting the COVID-19 virus which endangers himself and those around him.[13]

The phenomenon that occurred in the research at the Tanjung Market, Jember Regency, traders felt uncomfortable if they always wore masks because they felt it was difficult to breathe and felt congested so that even though traders obeyed health protocols, most of them took off their masks when they did not meet with customers. If this happens a lot in society where a person takes off his mask because he feels uncomfortable and finds it difficult to breathe coupled with a lack of self-awareness in himself, this is a risk for COVID-19 transmission, causing the spread of the COVID-19 virus to increase day by day.[17] Compliance with the COVID-19 protocol is implemented consistently and followed by good self-awareness can reduce the risk of increasing the spread of the COVID-19 virus.[21]

Researchers assume that people who have good self-awareness will assume that the COVID-19 virus must be prevented from transmitting and spreading by implementing and complying with health protocols consistently by always wearing masks, washing hands or using hand sanitizers, maintaining a minimum distance of 1 meter, increasing body immunity by implementing a clean and healthy lifestyle (PHBS) and not holding events and attending events that gather a lot of people. This can lead self-awareness to good because people are more introspective and comply with the COVID-19 health protocol so as to reduce the risk of transmission and spread of the COVID-19 virus.[10]

Conclusion

Based on the results of the research and discussion above, it can be concluded that there is a relationship between self-awareness and compliance with the COVID-19 protocol during the New Normal period at Tanjung Market, Jember Regency. The results show a positive correlation value, which means that the higher self-awareness, the higher the adherence to the COVID-19 protocol. This study shows the importance of increasing self-awareness and consistent behavior in implementing COVID-19 compliance protocols so that people can improve their lifestyles and prevent COVID-19 disease.

Declaration Section

The researcher would like to thank to:
1. Respondents who have been willing to participate in this research and to
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3. The Department of Industry and Trade of Jember Regency and

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Table 1. Distribution of characteristics of respondents by age in Tanjung Market, Jember regency (n= 230)

Variable	Median	Min-Max
Age (years)	40.00	(16-81)

Table 2. Distribution of characteristics of respondents by gender, education level, religion and comorbid (n=230)

Variable	Frequency (amount)	Percentage (%)
Gender		
Man	134	58.3
Girl	96	41.7
Level of education		
No school	1	0.4
Elementary School	50	21.7
Junior High School	65	28.3
Senior High School	98	42.6
Academy/ College	16	7.0
Religion		
Islam	224	97.4
Christian	5	2.2
Hindu	1	0.4
Comorbid		
Do not have	211	91.7
Diabetes mellitus	5	2.2
Hypertension	12	5.2
Asthma	2	0.9

Table 3. Distribution of respondents based on self-awareness by traders at Tanjung Market, Jember regency (n= 230)

Category Self Awareness	Frequency (f)	Percentage (%)
Good Self Awareness	50	21.7
Self-Awareness Enough	180	78.3
Less Self Awareness	0	0

Table 4. Distribution of respondents by category of COVID- 19 protocol compliance by traders at Tanjung Market, Jember Regency (n=230)

Compliance Category	Frequency (f)	Percentage (%)
High Compliance	120	52.2
Enough Compliance	100	43.5
Low Compliance	10	4.3

Table 5. Data analysis of the relationship between self-awareness and compliance with the COVID- 19 protocol during the new normal period at Tanjung Market, Jember regency (n=230).

Variable	p value	R
Self-Awareness COVID-19 Protocol Compliance	0.024	+0.148

An exploration of stress management for children during COVID-19: A literature review

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Abstract

Since its emergence, Covid-19 has attracted worldwide attention for almost the last 2 years. The impact caused by the pandemic is not only the decline in public health, but also the collapse of the economy, social life, and the world's education system. The community is required to be able to adapt to the pandemic situation which requires everyone to just stay at home, limit contact, and even carry out all activities only at home, including working and studying from home. This change in habits is not only experienced by adults, but also experienced by children. Prolonged isolation conditions experienced by children often cause boredom to trigger stress in children. Here, we conducted a non-systematic and comprehensive search across four databases such as PubMed, ProQuest, Scopus, and Google Scholar to find answers: How was the overview of children's psychological problems and stress during the Covid-19 pandemic and what the prevention and treatment can be done. Families, schools, and the government have their respective roles in maintaining the resilience and health of children, both physically and mentally. However, families show the most important role in accompanying children while at home by applying appropriate parenting patterns and communication techniques to prevent psychological problems for children. Thus, parents must be able to adapt to the pandemic situation as well as possible and be able to manage the stress experienced to take care of their children optimally.

Keywords: COVID-19, stress management, children, psychological

Background

The Covid-19 pandemic has succeeded in drastically changing the habits of the world's people, especially in their way of socializing and their daily lifestyle. The World Health Organization [WHO] (2020) has designated Covid-19 as a Public Health Emergency of International Concern (PHEIC)[1] which has claimed many lives worldwide.[2] Until August 2021, more than two hundred million cases had been reported from 204 countries in the world[3] and in Indonesia, Covid-19 cases had reached 3,930,300 in mid-August 2021.[4] The province of Bali itself is recorded as the 10 provinces with the most Covid-19 cases in Indonesia with a total of 106,458 cases until the end of August 2021.[5]

Indonesia and other countries in the world have limited physical contact and isolation for their people to slow down the transmission of Covid-19. The Indonesian government has quarantined suspected infected patients, restricted domestic and international travel, closed public and tourist places, and closed offices and schools. These policies have a very significant impact on the decline in the economic and social sectors, daily habits to aspects of children's lives. Children are said to be invisible victims of the Covid-19 pandemic due to short and long-term impacts on children's health, welfare, development, and future.[6] Social restrictions and rapid changes in learning methods from offline methods to online methods that are only carried out at home are believed to have an impact on children's psychology and mentality.[7,8] Children tend to easily experience stress and behavioral disorders, such as decreased attention, difficulty sleeping, decreased appetite, and fear.[9]

In addition, as many as 30% of children experience post-traumatic stress disorder due to prolonged social isolation.[7] Isolation conditions cause children to be limited from social interaction which is an important need for the normal development of psychological and social aspects of children. Moreover, if children are separated from their parents or have to lose their parents due to the pandemic, it would give long-term effects on mental health, mood disorders, psychosis and the risk of suicide in adulthood.[7,10] Stress and other psychological problems experienced by children depend on the stage of the child's age.[10] Various risks of psychological disorders that can be experienced by children should be prevented or treated early to prepare the younger generation to be physically and mentally healthy. Not only teachers, parents and all family members have an essential role in educating children during the pandemic without adding to the burden or stressor for children. However, most parents and families complain that they are confused about being able to survive for a long time with the conditions of learning from home with children.[11] In addition, the impact of long-standing isolation and social distancing on children has not been handled properly.[12] The purpose of this study is to discuss and provide an overview of the stress and psychological problems experienced by children during the pandemic and the efforts that can be made to overcome them.

Methods

The method in this study uses a literature review technique by identifying reference sources related to the topic. The search was carried out on 4 databases namely PubMed, ProQuest, Scopus, and Google Scholar by entering related keywords, namely "Stress in children" "Covid-19 pandemic" "Child psychological problems" "Prevention and handling of child stress during a pandemic". The data obtained from

each article that is appropriate to the topic then summarized and synthesized to be presented in a literature review.

Results and Discussions

Changes During Pandemic and Psychological Impact

The COVID-19 pandemic has changed of human life and presents an unrivaled challenge to people health, economic, social habit, and world of job for many people. The social and economic disturbance that caused by the pandemic is damaging. Tens of millions of people are at risk of poverty condition, while the number of mistreated people is increasing.[13]

Several changes in society during the pandemic, such as stay at home behavior, decrease in close contact behavior with other people, and behavior using masks were like a habit for people when they go out. The implementation of these behavioral changes showed a positive impact on reducing the spread of cases in Hong Kong to 47%.[14] In addition, the government has closed schools and directed learning methods to online learning. Children are required to learn from home accompanied by parents. This has an impact on increasing stressors for both parents and children who are not used to the situation.[8] In the situation of the ongoing COVID-19 pandemic, most of parents are having to adjust their lives to cope with working at home besides child management. As the consequence, this unexpected overload has put parents under extra stress, potentially increasing the child's risk of facing behavioral and emotional problems.[15] During the pandemic, parents are also required to be able to manage their home well during the stay-at-home period that ordered by the government. Parents are expected to have the skills to fill the time with their children at home which could promote health and emotional well-being.[16]

Generally, although children have experienced an extreme disruption of routine due to school closures and lack of outdoor activities, they may not be fully sheltered. In most cases, the parents were at home. In this regard, some children and adolescents may not automatically face actual feelings of loneliness, as they can recoup by spending more time with their family members and also increasing the time spent with social media and the internet.[12] This unusual moment we are facing is an uncommon global event situation with many special factors. People are affected in various ways, their physical, psychological, and emotional well-being is impaired, along with social and economic problems. The diversity and variety of biopsychosocial stressors brings a multifactorial approach to the COVID-19 pandemic, leading to uncertain effects on the mental health of vulnerable populations such as children and adolescents.[12] The impact of these changes for children and adolescents are inattention, clinging, worry and irritability.[9] Furthermore, isolated children may get an increased risk of post-traumatic stress disorders, psychiatric disorders and a higher risk of developing psychosis, mood disorders and even suicide attempts.[7] Changes that occur in daily routines due to the pandemic, can especially harm children and adolescents, in turn, it can become a critical public health problem in the future. In addition, we emphasize that children can experience both short-term and long-term consequences of COVID-19 stressors, as they exhibit individual responses. The opening of cities and the redevelopment of some unchecked daily activities could lead to new cases, which also creates a wave of hope and frustration especially among young people who don't know how to deal with it.[12]

Preventive and Treatment of Children's Psychological Problem
Family's Role

Families, especially parents, play an essential role in creating a conducive home situation during their stay-at-home period with their children. Parents can apply several methods of behavior regulation in parenting for children in order to adapt to current changing situations.

Help parents set clear expectations about their children

Each family member is expected to be able to introduce and apply the rules at home verbally and visually by giving direct examples to the children. This strategy is believed to increase the positive behavior of individuals and groups and reduce problematic behavior in various populations. Children can also be reminded that when they remind each other about the rules that have been applied by the family, they have performed commendable behavior or heroic actions [16].

Introduce an activity schedule and use a timer

Preparation of a daily activity schedule can be an option for parents to form children's independent behavior and responsibility for obligations. Children can be involved in the preparation of daily activity schedules according to their choice to increase children's independence in self-regulation and their environment. Parents can also apply the use of timers in a fun way in carrying out certain activities so that children feel the activities carried out are more exciting and challenging. However, do not let the children feel stressed with the application of punishment if they cannot do the activities according to the set timer [16]. Parents should incorporate physical activity into children's activity schedule (including using electronic media to facilitate participation) and encourage the whole family to join in while adhering to regulations on physical distancing and access to outdoor spaces. Prolonged sitting should be stopped every 30-60 minutes by standing or body stretching for 1 minutes or more. They should follow sedentary recreational screentime recommendations and encourage co-viewing and positive social interactions and experiences to help children to get enough sleep, keep bed and wake times consistent, and avoid screen use before bedtime.[17] In addition, parents should be able to ensure that the child's sleep time is appropriate for his age. Children who use screen time longer generally experience poor sleep quality due to sleeping late and waking up late.[18]

Promoting Family Values and Norms

Teach and support the formation of empathy among family members. This strategy can be started by listening to children's complaints and using empathetic statements when they tell the stories. Teach them that every family member has their own power to complete each other and protect another's health and well-being. Families can also use the "Life Timeline" strategy of using memorable photos to raise awareness of the importance of each moment by flashbacks to how they felt from the situation in the photo and what they learned from the events in the photo.[16]

Increasing Positive Reinforcement

During the stay at home, parents should increase positive reinforcement for children for what positive behavior he did. Positive reinforcement can be in the form of praise from parents.[16] Families should be able to apply good communication patterns within the family, including for children. Give children reassurance that they can express how they feel to parents and reassure children that each family member will look out for each other to help overcome anxiety and problems experienced.[19]

School Teacher's Role

Teachers should promote movement behavior guidelines for the pupils, and support the occasion to integrate healthy movement messages, practices, and strategy into daily home-school routines and lessons. Teachers can apply it when scheduling online learning, restricting prolonged sitting and encouraging posture changes such as standing regularly, body moving or stretching.[17]

Government's Role

Governments should recommend healthy exercise or movement behaviours in children as a part of strategies and public messaging, and should engage pivotal people for the promotion strategy.[17] In addition, many families need appropriate financial support since they have lost their source of income. The government need to prepare for the financial support strategy for those families to reduce the deterioration of health condition in a population which is already of severely affected by social inequality.[12]

Moreover, governments and public health authorities need to examine the impact of this uncommon situation on children and youth by implementing mitigation measures and providing investments to reduce the destruction. However, because the impact on individual health is multifactorial, the resources launched and efforts to reduce this damage should include health authorities, governments, organizations, communities, schools and family members.[12] Some strategies which can be implemented to prevent children's psychological problems such as (i) providing an appropriate online environment for students to develop scientific activities (e.g. creating an appropriate online platform), (ii) provide motivational videos that can help enhance their daily lifestyle (e.g. how to to have a balanced diet, exercise at home, and regulate sleep), (iii) provide access to adequate information (e.g. how to implement proper hygiene practices) and (iv) provide access to professional psychological support.[12,20] and provide telehealth for counseling and reduce mental health burden for children and parents.[21]

Conclusion

The long-lasting Covid-19 pandemic has had a major impact on children's growth and development, especially mentally and psychologically. Prolonged stress, fear, and anxiety can have an impact on children's psychology when they enter adulthood. Children need special attention from various parties to be able to adapt to this unusual condition. Disruption of the psychological condition of children can be prevented and handled with the cooperation of all family members, schools, and the government. Parents should be able to apply appropriate parenting and communication patterns while at home with their children, while the school is expected to provide physical activity programs as well as for online learning systems. The government also has a role to play in ensuring the financial resilience of the community and providing various innovative programs for children such as online education platforms.

Declaration Section

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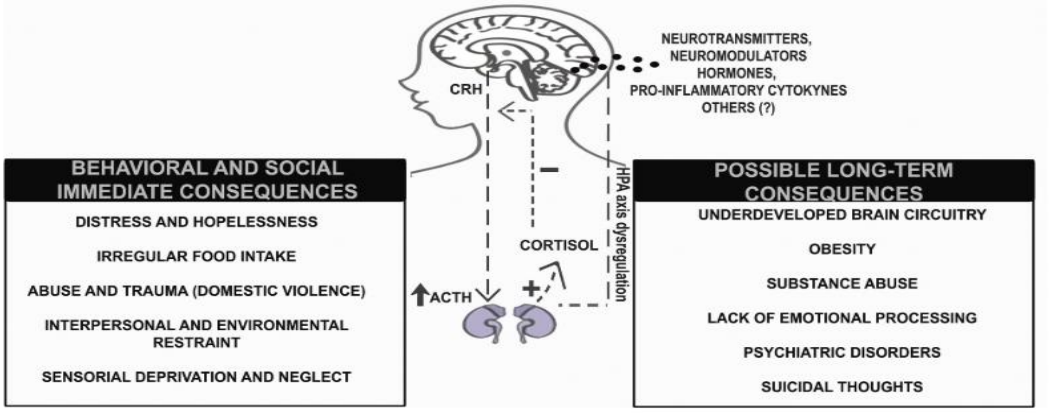

Figure 1. Possible affects from COVID-19 pandemic stressors on children and adolescence's life.[12]

Analysis associated of sensitive nutrition interventions with stunting prevalence in children 0-23 months in the 10 highest stunting provinces in Indonesia

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Abstract

The National Strategy for the Acceleration of Stunting Prevention 2018-2024 in Indonesia focuses on intervention activities in two categories, namely specific and sensitive interventions. This study aims to analyze the relationship between sensitive nutrition interventions in accelerating stunting prevention with stunting prevalence in children 0-23 months in the 10 highest stunting provinces in Indonesia. The cross-sectional research design used Indonesia's Basic Health Research 2013 secondary data. The sample size was 6905 children aged 0-2 years from the 10 highest stunting provinces in Indonesia. Statistical analysis included univariate, bivariate with chi-square and multivariate with logistic regression at a significance level of 5%. Stunting of children 0-23 months in 10 provinces with the highest stunting rate in Indonesia is 37.4%. The results showed that there was a relationship between gender and toilet ownership with stunting in children aged 0-2 years ($p<0.05$). The multiple logistic regression model shows that toilet ownership is the dominant factor associated with stunting in children 0-2 years old in the 10 highest stunting provinces in Indonesia with an OR 1.207. This shows that families who do not have their own toilets will be at risk of having stunted children 1.2 times higher than families who have their own toilets. This study concludes that toilet ownership plays the most role in stunting prevention efforts. These findings are expected to convince policy makers to integrate sensitive interventions in stunting prevention to ensure that children under two years of age meet the recommended growth standards.

Keywords: sensitive, toilet ownership, stunting under two years old

Background

Linear growth failure (stunting) in early childhood serves as a marker of various pathological disorders associated with increased morbidity and mortality, loss of physical growth potential,[1] decreased neurodevelopmental and cognitive function,[2] decreased economic capacity and increased risk of metabolic disease and chronic in adulthood.[3] Approximately 1% decrease in height in adults caused by stunting in childhood reduces economic productivity by 1.4%. The World Bank released the gross domestic product (GDP) lost due to stunting reaching 2% to 3% per year. If Indonesia's GDP in 2018 was 14,837 trillion rupiah, stunting caused a loss of 300-400 trillion rupiah per year in Indonesia.[2,4] The productivity loss for individuals due to stunting is estimated to be more than 10% of lifetime income.[5] If the average income of the Indonesian population in 2019 is 59 million rupiah per year, stunting causes a loss of 5.9 million rupiah per year.

The Joint Child Malnutrirtion Estimates 2021 Edition states that 149.2 million children in the world (22.0%) under the age of five were stunted in 2020. South Asia has the highest prevalence of stunting among any sub-region in Asia. Regionally, the stunting rate in Asia has decreased from 24.5% in 2015 to 21.8% in 2020, but stunting in children in Southeast Asia was recorded at 27.4% or 15.3 million in 2020.[6] Stunting in children aged 0-2 years (baduta) in Indonesia was recorded at 32.9% in 2013, 26.1% in 2016, and 29.9% in 2018. The stunting rate among children under two years of age increased from 2016 to 2018 by 3, 8%. If referring to the WHO cut off point for public health problems (>20%) then stunting in children under two in Indonesia is still a chronic public health problem.[7] The stunting rate for children under two in Indonesia is also still above the global and Asian stunting rates [8] as well as above the stunting average in developing countries (25%).[9]

Multilevel logistic regression analysis of data from the 2013 Indonesian Basic Health Survey on 24,657 children under two years old showed that stunting in children under two in Indonesia occurred due to differences in clusters/districts/provinces. In addition, there are differences in individual and household characteristics so that integrated interventions are needed during the prenatal and postnatal periods. The intervention method uses a multisectoral approach to address various factors from the community to the individual level.[10] Experiences in many countries such as Peru, Ethiopia, Senegal, Nepal and the Kyrgyz Republic have noted rapid progress in reducing stunting through specific and nutritionally sensitive interventions.[11] The stunting reduction program in Ethiopia reported that the key factors in stunting interventions were an increase in the total yield of edible crops (32%), an increase in the number of health workers (28%), a decrease in open defecation (13%), parental education (10%), maternal nutrition (5%), economic improvement (4%), and decreased incidence of diarrhea (4%).[12] This study aims to analyze the relationship between sensitive nutrition interventions in accelerating stunting prevention with stunting prevalence in children 0-23 months in the 10 highest stunting provinces in Indonesia.

Methods

Data source

This study is the result of further analysis of secondary data from the 2013 Basic Health. Research involving 27.779 children under the age of five in 33 provinces in Indonesia. Furthermore, the researchers analyzed data on children under the age of five in the 10 highest stunting provinces in Indonesia based on the Limited Meeting of the President of the Republic of Indonesia on August 5, 2021, which was presented by the Directorate General of Regional Development, Ministry of Home Affairs, Republic of Indonesia.[13] The ten provinces include Aceh, Central Kalimantan, West Kalimantan, South Kalimantan, West Sulawesi, Central Sulawesi, Southeast Sulawesi, Gorontalo, NTB and NTT.

Study population and sample size

The population of this research is children aged 0-2 years who live in the 10 highest stunting provinces in Indonesia. The research sample is children aged 0-2 years who live with their mothers in the 10 highest stunting provinces in Indonesia. Researchers carried out a data cleaning process to eliminate missing data with the inclusion criteria of the children aged 0-2 years measured by height and the exclusion of the children aged 0-2 years with incomplete data according to the research variables. The number of samples of children under two years involved in the study was 6905.

Ethics statement

Basic Health Research 2013 has been approved by the Health Research Ethics Commission of the Health Research and Development Agency No.LB.02.01/5.2/KE.006/2013.

Statistical analyses

The dependent variable, namely stunting, is presented as a binary variable (0 = no stunting, 1 = stunting) using the z-score value. A child is said to be stunted if his height for age (z-score) is less than minus two standard deviations below the median WHO Child Growth Standards based on PMK No. 2 of 2020 concerning Child Anthropometry Standards. The z-score value was processed using WHO-Anthro.

The independent variables were selected according to the sensitive intervention group based on the National Strategy for the Acceleration of Stunting Prevention (15). Sensitive nutrition intervention data available at Basic Health Research 2013 includes drinking water quality, toilet ownership and family planning (FP). The quality of drinking water is categorized as clean water and not clean water. Water is classified as clean if the physical quality of drinking water is not cloudy, colorless, tasteless, does not foam, and does not smell. Ownership of latrines is categorized as self-owned and not self-owned (commonly owned, public, and non-existent). Family planning (FP) is categorized as yes (if using contraception) and no (not using contraception). Statistical analysis was performed by chi-square test and multivariable logistic regression at a significance level of 5%.

Results and Discussions

The results show that 6905 children under the age of two years in the 10 highest stunting provinces in Indonesia are mostly male (50.2%) and 37.4% of children under two years are stunted (Table 1). The highest stunting was found in East Nusa Tenggara (NTT) Province at 43.8% followed by Central Sulawesi Province at 40.8%

and South Kalimantan at 39.1% (Figure 1). Sensitive interventions in the 10 provinces with the highest number of stunting in Indonesia include clean drinking water with a coverage of 91.2%, latrine ownership 66.2% and family planning 48.9%. The chi-square test showed that there was a relationship between gender and latrine ownership with stunting in children aged 0-2 years ($p<0.05$) in the 10 highest stunting provinces in Indonesia (Table 2). The multiple logistic regression model showed that toilet ownership was most closely related to stunting in children under two years with an OR 1.207 (Table 3). This shows that families who do not have their own toilet will be at risk of having stunted children 1.2 times higher than families who have their own toilet.

The target of the Indonesian government in the National Medium-Term Development Plan 2020-2024 is to reduce stunting to 19% in 2025[16] from the baseline stunting in 2013 of 37.2%.[13] A number of studies suggest that stunting begins in the womb and is associated with low levels of growth hormone (IGF-1) at birth so that children experience failure to thrive.[3] Therefore, stunting prevention interventions are prioritized from the time the child is born until the child is two years old.[2] Senegal's success in reducing stunting is largely due to political stability, government priorities on nutrition and the implementation of nutrition efforts by increasing the availability of maternal health and education services, access to piped water and sanitation facilities.[14] Based on the experiences of various countries in the world in the success of stunting prevention, Indonesia developed a National Strategy for the Acceleration of Stunting Prevention which focuses on intervention activities in two categories, namely specific and sensitive interventions. This study will focus on the role of sensitive interventions in stunting prevention efforts in the 10 highest stunting provinces in Indonesia by analyzing the 2013 Basic Health Research data. NTT Province has the highest prevalence, followed by Central Sulawesi and Central Kalimantan. Stunting prevention strategies are designed using specific nutritional interventions that will target the direct causes of stunting and sensitive nutrition interventions that target indirect causes. One of the sensitive nutrition interventions is aimed at improving clean water and sanitation facilities and improving health services.[15]

Clean water, sanitation and hygiene services implemented on a large scale in Ethiopia are reported to prevent the high number of stunting cases.[16] A literature study to investigate environmental conditions including water availability, sanitation and hygiene and their relationship to nutritional status, and governance of children from birth to 5 years of age in Sub-Saharan Africa shows that understanding the environment and its relationship to specific health is essential to address the burden of malnutrition in children.[17] Another study in Africa also demonstrated an important relationship between access to water and the nutritional status of women and children.[18] Poor water quality has been reported along with various negative health outcomes in Saharawi refugee camps in Algeria.[19] This study did not find a relationship between drinking water quality and stunting in children under two years old. This could be because the drinking water coverage data showed a homogeneous distribution. The coverage of clean drinking water has reached 91.2% with the criteria for water not cloudy, colorless, tasteless, not foamy, and odorless.

Handling stunting in Brazil is associated with improving the socioeconomic status of families through increasing income, providing clean water and stunting as sensitive efforts.[20] The intervention is in the form of social capacity development, the content is in line with the planting of family life planning carried out such as the Family

Planning Village (KB) and shows the effectiveness of the practice of a clean and healthy lifestyle (PHBS) and the role of fathers in child care as an effort to intervene in stunting from a sensitive aspect.[21] A study in India revealed the fact that women with a birth spacing of less than two years are more at risk of having children who are underweight which eventually leads to stunting. Birth spacing of more than three years will further reduce this risk. This finding explains the importance of birth planning or family planning to improve child nutrition.[22] The results of this study did not find a relationship between family planning and stunting in children under two years old. However, it was found that under-five stunting was higher in the group of mothers who did not use family planning in the provinces of West Kalimantan, Central Kalimantan, and NTT. Studies in South Asian countries report that children born more than 24 months after marriage have a lower susceptibility to stunting. planning for births within 24 months can reduce stunting rates in developing countries.[23] Handling stunting with a family approach related to setting birth intervals has an effect on reducing stunting prevalence.[24]

The 2006 national Rural Economic & Demographic Survey (n=7949) in rural India shows that access to toilets and latrines represents an indicator of development and an important factor in child mortality and child physical development in India.[25] A study to examine the relationship between water, sanitation and child development using data from 7715 children from Ethiopia, India, Peru, and Vietnam showed stunting in one-year-old children was less common in children with good toilet access than in those without. have access. This difference persists when the child is 5 and 8 years old. This demonstrates the importance of access to better toilets in infancy, not only during the first year, but continuing into childhood.[26] Toilet sharing was significantly associated with stunting in a study of children under five in the Provinces of East and West Rwanda using data from the 2014-2015 Rwandan Demographic and Health Survey.[27] This study also found that latrine ownership was significantly associated with stunting in children under two years old. Families who have their own latrine or toilet make it easier to access their own toilet, thereby reducing the risk of stunting in children. The risk of stunting in children under two years increased by 1,207 times higher in families who did not have their own latrines or toilets compared to families who had their own latrines. The coverage of latrine ownership in the 10 highest stunting provinces only reached 33.8%. Gorontalo Province has the lowest latrine ownership coverage (48.4%) followed by West Sulawesi (48.5%) and Central Sulawesi (58.4%).

The low coverage of latrine ownership indicates that low utilization of sanitation facilities in the form of healthy latrines results in the direct distribution of materials that are harmful to humans due to the disposal of human waste. Healthy latrines must be built, owned and used by families with placements (inside the house or outside the house) that are easily accessible to residents of the house to prevent disease transmission.[28] This is because unsanitary toilets or latrines lead to the discharge of fecal contaminants directly onto the ground or into seawater which can cause diarrhea that contributes to stunting.[29] Recurrent diarrheal diseases have been reported to affect optimal growth and development of children and cause children to experience stunting. Children who suffer from three disease histories have a risk of suffering from stunting 1.6 times higher than children who do not suffer from the disease, and 1.1 times with children who have 1 history of disease and 1.2 times with children who suffer from 2 diseases.[30] A study of children under two years in 100 households in Angola reported that out of 232 stunted children (32%) the incidence of diarrhea (PR 1.39 [95% CI: 1.07-1.87]) was associated with stunting.[31]

Conclusion

This study uses 2013 Basic Health Research data and investigates the role of sensitive nutrition interventions in accelerating stunting prevention in the 10 highest stunting provinces in Indonesia. The study found that latrine ownership played the biggest role in stunting prevention efforts. These findings are expected to convince policy makers to integrate sensitive interventions in stunting prevention to ensure that children under two years of age meet the recommended growth standards. The study only utilizes secondary data with a response rate of <100% so that further studies with greater statistical power or stronger methods are needed to explain causality.

Declaration Section

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Table 1. Univariate analysis result (N=6905)

Characteristics	n	%
Age group	6905	100
Stunting		
No Stunting	4320	62.6
Stunting	2585	37.4
Sex		
Boys	3467	50.2
Girls	3438	49.8
Clean Drinking Water		
No	611	8.8
Yes	6294	91.2
Toilet Ownership		
No Self-Owned	2334	33.8
Self-Owned	4571	66.2
FP		
No	3526	51.1
Yes	3379	48.9

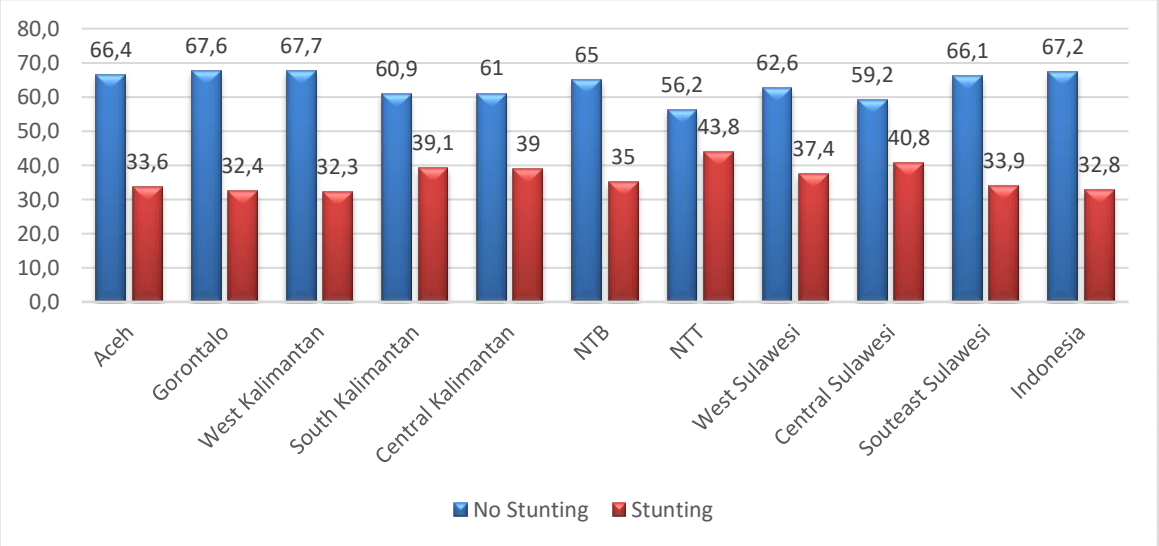

Figure 1. Stunting prevalence in the 10 highest stunting provinces in Indonesia 2013

Table 2. Result of Chi square analysis (N=6905)

Characteristics	No Stunting	Stunting	OR	95% C.I.	
				Lower	Upper
Age group	6905				
Sex					
Boys	59.8	40.2	0.79*	0.717	0.871
Girls	65.3	34.7			
Clean Drinking Water					
No	61.2	38.8	0.93	0.792	1.114
Yes	62.7	37.3			
Toilet Ownership					
No Self-Owned	59.6	40.4	1.21*	1.089	1.336
Self-Owned	64.1	35.9			
FP					
No	62.7	37.3	0.98	0.896	1.089
Yes	62.4	37.6			

*p<0.05

Tabel 3. Result of the multivariable logistic regression analysis (N=6905)

Characteristics	B	Exp(B)	SE	95% C.I.	
				Lower	Upper
Sex	-0.236	0.79*	0.050	0.716	0.871
Toilet Ownership	0.188	1.207*	0.052	1.089	1.337
Constant	-0.414	0.661*	0.105		

*p<0.05

Spiritual-well-being and resilience in patients with type 2 diabetes mellitus

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Abstract

Psychological problems can be experienced by patients with type 2 Diabetes Mellitus (DM), especially related to the long-term treatment. Therefore, they need coping strategies such as spirituality to become resilient. This research aimed to analyze the correlation between spiritual well-being and resilience in type 2 DM patients. It applied quantitative research with cross sectional approach. A total of 124 type 2 DM patients were involved and selected by systematic random sampling technique. Data collection was conducted by 2 questionnaires: Spiritual Well-Being Scale (SWBS) and The Connor-Davidson Resilience Scale (CD-RISC). The median score of spiritual well-being was 78 (min-max= 62-108). Meanwhile the median value of resilience was 72 (min-max= 42-100). The Spearman Correlation test showed a positive moderate correlation between spiritual well-being and resilience (p value = 0.001, r = 0.446, α = 0.05). The higher the value of spiritual well-being, the better the level of resilience of patients with Type 2 DM. Assessment and improvement of spiritual well-being can be a means to enhance the resilience in type 2 DM patients.

Keywords: type 2 diabetes mellitus, spiritual well-being, resilience

Background

A person with type 2 DM will face possible changes in physical appearance, limitations, and obstacles in carrying out daily activities, difficulties in dealing with treatment and its side effects, and readjustment to new conditions. These things can cause psychological problems, such as depression, anxiety disorders, and eating disorders.[1] The various issues that can arise require the patients to adapt to survive and continue their life by looking for coping strategies. One of the coping strategies that can be used is spirituality.[2]
Spiritual well-being is perceived as reflected in the quality of a person's relationship in four areas, namely with God, other people, nature, and oneself.[3] The results of research showed the average value of spiritual well-being of 223 respondents with tipe 2 DM was 30.59 out of 48.[4] Other study showed the average spiritual well-being value of 145 respondents was 31.37 out of 48.[5] Spirituality helps people build self-control even when they are sick and can develop adaptations in dealing with chronic illness. Spiritual activities can produce feelings of calm and security and reduce anxiety and stress in patients.[6] In addition, high spirituality can make a person able to rely on his internal strength in dealing with any problems so that the person tends to have good resilience skills.[7]

Resilience refers to the human ability to face stressful challenges and maintain or restore normal function.[8] Forty seven (66.4%) people with DM had high resilience, 15 people (21%) had moderate resilience, and the remaining nine people (12.6%) had low resilience with an overall average score of 147 out of 175.[9] Other study found that 52 people with type 2 DM (21%) had high resilience, 136 people (54.8%) had moderate resilience, 42 people (16.9%) had low resilience, and the remaining 18 people (7.3%) had very low resilience.[10]

Resilience in individuals with Type 2 DM is needed to help them overcome the disease and achieve greater adherence to treatment and affect how they manage their illness.[1] The management of diabetes mellitus lasts a long time, namely throughout the patient's age. Adjustments are required, influenced by their views on self-integrity, self-regulation, and resilience.[11] This study aimed to analyze the relationship between spiritual well-being and resilience in Type 2 DM patients.

Methods

This research was quantitative research with a cross-sectional approach. The sample was determined by G* Power application (α error probability: 0.05, power (1-β error probability): 0.90, correlation ρ H1: 0.30) and obtained a sample of 112. This number was added by 10% to anticipate dropouts, bringing the total number of respondents to 124 people. Systematic random sampling was applied to determine the sample of this study. The first sample was decided based on the randomization results of 33 Type 2 DM patients who came for a check-up on the day before data collection. From the randomization, it was found that patient number 5 would be the first sample based on the order of arrival. A sampling *interval of 3 was applied to* select the following respondents. The inclusion criteria in this study were Type 2 DM patients aged 20-79 years, had compos mentis consciousness, communicated well, and were willing to be research participants. Exclusion criteria were having physical limitations such as deaf and speech impaired, in conditions that made it impossible to continue research such as hypoglycaemic/hyperglycaemic and had a history of co-morbidities (complications).

Data collection was carried out on January 28 - March 9, 2020, at the Jember Klinik Hospital, Jember, East Java, Indonesia. Data were collected using the Spiritual Well-Being Scale (SWBS) and The Connor-Davidson Resilience Scale (CD-RISC) 25 questionnaires. The validity and reliability test of the Indonesian SWBS questionnaire was 0.96 for the CVI value and 0.911 for α-Cronbach.[12] This questionnaire consists of 19 questions divided into two indicators, namely religious well-being (RWB) and existential well-being (EWB). Scoring uses a 6-point Likert scale ranging from "strongly disagree" to "strongly agree" with a numerical value of 1-6. The resilience measurement was carried out using the Indonesian CD-RISC 25 questionnaire with a Cronbach value of 0.86 and convergent validity with stress and social support measure.[13] This questionnaire consists of 25 questions covering five indicators: personal competence, acceptance of change and safe relationships, trust/tolerance/reinforcement of stress effects, control, and spiritual influence. Scoring is done using a Likert scale of 0-4 ("disagree" – "strongly agree") so that the range of assessment scores is 0-100 (Connor and Davidson, 2003). The analysis used the Spearman correlation test (α = 0.05). This research had obtained ethical approval from the Health Research Ethics Committee / KEPK, Faculty of Dentistry, the University of Jember with number 765 / UN25.8 / KEPK / DL / 2019.

Results and Discussions

Table 1 shows the mean age of the participants was 61.56 (8.91) years. There were more female participants than males (63.7%). The most common educational background was high school level (38.7%). Most of the respondents were housewives (44.4%) and married (74.2%). The range of illness duration was 1-35 years.

Table 2 shows that the value of spiritual well-being was in the range of 62-108, with a median value of 78. As many as 25% of participants had a spiritual well-being value of <72, and the other (75%) had <88. These two variable indicators show the same range of values, namely 31-54, with a median of 37 for EWB and 41 for RWB. In the first quartile (Q1), both showed the same value, namely 36, which means 25% of the participants had a score of <36, while in the third quartile (Q3), the EWB and RWB indicators had different values, namely 41 and 48, respectively, where 75% of the participants had an EWB value <41 and RWB had a value <48.

Table 3 shows a range of resilience values of 42-100 with a median value of 72. As many as 25% of participants had a resilience score of <66, and the remaining 75% had a value of <75. Of the five indicators, the positive acceptance of change and good relations with others showed the highest median value of 18 in the range of 12-24. As many as 25% of participants had this indicator value of <17, and the other (75%) scored < 19. Meanwhile, the lowest mean score indicator was personal competency, high standard, and tenacity, namely 11 with a range of 5-16 values. As many as 25% of participants had this indicator value of <10, and the other 75% scored <12. Table 4 shows a positive moderate correlation between spiritual well-being and resilience in Type 2 DM patients (p-value = 0.001, r = 0.446). A positive relationship indicates the higher the value of spiritual well-being, the higher the resilience value.

Spiritual Well-being

The results showed that the median and average of spiritual well-being were 78 and 81.51, respectively. As many as 25% of participants had a spiritual well-being value <72, and 75% had a value <88 with a range of 62 to 108. The higher the value obtained from the measurement with the SWBS questionnaire, the better the

spiritual well-being of the participants. Based on the high measurement results, which were close to the maximum value (114), the spiritual well-being of Type 2 DM patients in this study was good. A study showed the average value of spiritual well-being in diabetes mellitus patients in urban areas was 97.73, while in agricultural rural areas was 98.90.[14] In another study, the average value of spiritual well-being was 95.85 and 84.06.[15,16]

Spirituality is defined as an aspect of humanity that refers to the way individuals seek and express their meaning and purpose and their way of experiencing their connectedness with the present, themselves, others, nature, and something essential or sacred.[4] Spirituality helps a person build self-control even when they are sick and can develop adaptations in dealing with chronic illness. Spiritual activities can produce feelings of calm and security and reduce anxiety and stress in patients.[6] Since type 2 DM patients in this study had good spiritual well-being, it indicated that they have good relationships with themselves, others, the environment, and God, which helps them find meaning and purpose in life, adapt to their illness, and gain serenity from the spiritual activities.
Spiritual well-being is used to measure the purpose of life (existential well-being) and relationship with God (religious well-being) as a supreme power, or other things as long as it refers to truth, wholeness, love, and light.[17] This study showed that religious well-being had higher average and median values than existential well-being. The same results are also demonstrated by several studies.[15,16,18] The possible reason for this to happen is that belief systems and religious beliefs play an important role in spiritual development. Some patients consider their illness as part of God's goodwill and a form of divine providence and believe that health and illness depend on God.[19] From the explanation, the researcher assumes that the participants in this study use a religious perspective in responding to their illness and assume that their illness is God's goodwill, thus making them try to accept and overcome the problems related to their illness.

Resilience

The results showed that the range of resilience values was 42-100, with the median and average values of 72 and 71.98, respectively. As many as 25% of participants had a resilience score of <66, and the remaining 75% had a resilience score <75. The higher the score obtained from the measurement with the CD-RISC questionnaire, the better a person's resilience. Therefore, Type 2 DM patients in this study had good resilience because the value was high, and some participants reached a maximum value of 100. Similar result showed the average value of the resilience of 84 respondents was 97.07, with a maximum value of 116.[20]

Rojas defines resilience as the ability to face challenges where this will appear when a person faces a difficult experience and knows how to face or adapt.[21] The challenge can be in the form of various problems faced by a person, including the illness. Furthermore, resilience is defined as the extent to which a person can survive the illness they suffer and find potential and various life skills in suffering.[22] The result showed that Type 2 DM patients in this study had good resilience, indicating that they have adapted to their disease and used their potential to continue to do activities during their illness.

Indicators of positive acceptance of change and good relations with others show the highest value compared to the other resilience indicators. Based on these indicators, resilient people have close and secure relationships with those closest to them to function appropriately during the problems.[23] Family support is the most common

source received by patients. The support received allows diabetic patients to build interpersonal relationships with the people around them and the medical team. Because of this interpersonal relationship, a patient is interested in continuing to cooperate in their diabetes care.[24] From the explanation, it is concluded that a person's level of resilience is more influenced by the individual's relationship with the people closest to them.

The indicator with the lowest score was personal competence, high standards, and tenacity. This indicator implies that a resilient person views the challenges as positive and considers them something to be taken up, not feared.[23] Type 2 DM patients' perception of their disease that does not increase in healing causes negative feelings, such as feelings of hopelessness, anger, shame, and feeling that they no longer care about improving their health. This condition can lead to disability in various ways, both physically, psychologically, and socially. The stress felt by Type 2 DM patients as a result of changes in lifestyle, medication, treatment, complications as well as environmental conditions, and inadequate support can change a person's views and perceptions of the meaning, purpose, and satisfaction of life.[25] From this explanation, the perception of disease and stress experienced by Type 2 DM patients can cause negative feelings. These negative feelings will affect a person's effort and their development in dealing with problems.

Correlation between Spiritual Well-being and Resilience

The result showed a significant correlation between spiritual well-being and resilience in Type 2 DM patients. The strength of the correlation was moderate with a positive direction which means a high value of spiritual well-being will be followed by a high value of resilience. Incurable disease conditions, long (lifelong) treatment, and functional limitations require individuals to adapt.[1] The nursing theory approach promoted by Callista Roy can be used to improve adaptation toward the disease.[7] In Roy's Adaptation Model, four modes influence the formation of resilience, one of which is the self-concept mode.[26] The basic needs that underlie this mode are psychic and spiritual integrity.[27] Therefore, spirituality is related to the self-concept mode in Roy's Adaptation Model.[7] Spirituality generates and increases patient resilience, creates a sense of purpose and meaning in life, and increases confrontation and hope, which in turn the patient becomes compatible with the disease.[28] Spirituality increases patients' resilience in overcoming Type 2 DM and effectively responds to their chronic illness with positive thoughts and an attitude of hope for better health.[29]

Resilience is defined as the human ability to face stressful challenges and maintain or restore normal function.[8] Resilience develops in a reciprocal relationship between risk factors, characterized as negative events that affect daily life, and protective factors, which are favorable situations and assist in the search for resolution and positive adaptation.[1] Individuals with diabetes who have a high source of resilience tend to be more likely to control blood sugar, be responsible for maintaining a diet, be active, and create a supportive environment, rather than making excuses for blaming others. In other words, resilience can foster self-management for those with diabetes.[30]

Conclusions and Suggestions

The result of the study showed a moderate positive correlation between resilience and spiritual well-being in patients with type 2 DM. The higher the spiritual well-being of the patients, the higher the resilience. An assessment of the level of spiritual well-being in Type 2 DM patients is required as an initial step in determining and improving patient resilience in dealing with the disease.

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Table 1. Characteristic of type 2 DM patients (n = 124)

Characteristic	Mean (SD)	Median (min-Max)
Age (years old)	61.56 (±8.91)	-
Diabetes Duration (years)	-	6 (1-35)
	n	%
Gender		
Male	45	36.3
Female	79	63.7
Education Level		
None	1	0.8
Elementary School	14	11.3
Junior High School	17	13.7
Senior High School	48	38.7
University	44	35.5
Marital status		
Single	3	2.4
Married	92	74.2
Widow	29	23.4
Employment status		
Housewife	55	44.4
Farmer	2	1.6
Civil servant	16	12.9
Entrepreneur	17	13.7
Retired	34	27.4

Table 2. Spiritual well-being in type 2 DM patients (n: 124)

Variable	Mean	Median (Min-Max)
Spiritual Well-Being	81.51	78 (62-108)
Indicator of spiritual Well-Being		
Existential Well-Being (EWB)	39.04	37 (31-54)
Religious Well-Being (RWB)	42.47	41 (31-54)

Table 3. Resilience in type 2 DM patients (n: 124)

Variable	Mean	Median (Min-Max)
Resilience	71.98	72 (42-100)
Indicator of Resilience		
Personal competency, high standard, tenacity	11.16	11 (5-16)
Trust in personal's instincts, tolerance toward negative effects	16.57	16 (9-24)
Positive acceptance of changes and good relations with others	18.22	18 (12-24)
Control	13.84	14 (7-20)
Spiritual influence	12.19	12 (6-16)

Table 4. Correlation between spiritual well-being and resilience in type 2 DM patients (n=124)

Variable		Resilience
Spiritual well-being	r	0.446
	p value	0.001

The relationship of sugar, salt, and fat (SSF) consumption behavior towards healthy food choices in adolescents in rural areas

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Abstract

The excessive consumption behavior of sugar, salt, and fat (SSF) is one of the non-communicable diseases (NCD) causes in adolescents. In addition, food choices have also influenced someone's health. Sugar, salt, and fat (SSF) consumption behavior in this period influences an individual's eating habits and contributes to the degenerative disease risk factors. This research aims to analyze the relationship between sugar, salt, and fat (SSF) consumption behavior and the healthy food choices in adolescents in rural areas. This is observational analytic research with a cross-sectional design applied to 160 students chosen from 10 schools in Tulang Bawang Regency, Lampung Province. The subjects were taken using a multistage random sampling technique. The data about sugar, salt, and fat consumption behavior and healthy food choices were obtained through structured questionnaires that had been tested its validity and reliability. The data then were analyzed by Chi-squared test. The result shows that 78 (49.8%) respondents do not have adequate healthy food choices habits. Half of the total respondents (80 respondents) have inadequate sugar, salt, and fat (SSF) consumption behavior. Most sugar consumption behavior or 85 respondents answered in the seldom category (<3x per month), 53 respondents answered often (1-6x per week), 21 respondents stated always, and 1 respondent answered never. Salt consumption behavior revealed that 100 of 160 respondents answered seldom, 40 respondents stated often, 18 respondents stated always, and 2 respondents answered never. While for fat consumption behavior, 117 of 160 respondents answered seldom, 39 respondents stated often, and 4 respondents stated always. There is a relationship between sugar, salt, and fat (SSF) consumption behavior and healthy food choices (p=0.007). Then, there is a relationship between sugar, salt, and fat (SSF) consumption behavior and healthy food choices in adolescents in rural areas.

Keywords: behavior, sugar, salt, fat, healthy food choices

Background

The epidemiologist transition shifting has happened in Indonesia which causes the shifting of disease patterns and makes degenerative chronic diseases increased. Degenerative diseases such as cardiovascular disease, hypertension, diabetes, obesity, etc., have been caused by the changing or shifting meal patterns and lifestyle in society which head to unhealthy lifestyle such as the lack of physical activities, and junk food eating habits, the lack of fruit and vegetable consumption which cause the body gets fiber deficiency and risk to improve cholesterol level. If these conditions are not repaired, some kinds of diseases will appear; especially degenerative diseases.[1, 2]

More than 820 million people do not have enough food, and more than this number consume low-quality food which can cause micronutrient deficiency and contribute to increasing of substantial in obesity and non-communicable diseases, i.e. cardiovascular disease, hypertension, stroke, and diabetes. A bad eating habit will cause a higher risk of morbidity and mortality.[3]

In general, people around the world consume beverages with ten times more sugar than what is suggested, and 86% of people consume sodium more than what is being recommended. These happen because the Indonesian lifestyle has been influenced by fast food, instant food, snacks, and unhealthy cooking habit, the lack of knowledge about nutrients which leads the people to face food consumption risk habits.[4]

In Indonesia, the age ranges 15-19 years old has sweet food and beverages consumption behavior ranges between 41.0% and 56.4%. In Lampung Province, more than once a day sweetened food and beverages consumption behavior among 3-year-old children has increased 6.6% percent compared to 2013 with a proportion of 59.3% and in 2018 became 65.9%. Then, the proportion of more than once a day sweet food and beverages consumption behavior in Tulang Bawang Regency ranges 48.1% and 73.5%, and among group-aged 15-19-year-old adolescents ranged 41.7% and 57.5% where Tulang Bawang is regency with the second-highest proportion in Lampung Province.[5,6]

The consumption behavior of salty and fatty/cholesterol/greasy food in Indonesia increased in 2018 compared to 2014. The population proportion with salty and fatty/cholesterol/greasy food consumption in 2013 ranged between 26.7% and 40.7%, and in 2018 became 29.7% and 41.7%. In Lampung Province, the consumption habit of salty food has decreased 2.9% when in 2013 the proportion was 32.4%, then in 2018, it was 29.4%. However, the proportion of fatty food consumption habits increased 15.2% in 2013 from 21.4% to 36.6% in 2018. In Tulang Bawang Regency the proportion of salty and fatty food consumption habits among 15-19-year-old adolescents were 32.4% and 42.9%.[5,6]

The excessive intake of sugar, salt, and fat have been proven to increase the supported factors of non-communicable disease or the non-communicable disease itself. The excessive intake of simple sugar will contribute to obesity among junior high school students, the simple sugar intake risks 5.7 times towards the obesity in Kota Tangerang Selatan Junior High School students. Then, the consumption of high-sodium food or salty food consumption habit could influence the rising of blood pleasure or hypertension in middle-aged in Kota Manado, another evidence related

to excessive fat intake showed that there was an effect between excessive fat intake and excessive cholesterol intake with total cholesterol.[7,8,9]

Adolescence is a period of life between children and adults, aged between 10 to 19 years old. Adolescents are susceptible to health problems, where they have specific health risks, for example, adolescents aged 10-14 have a main health problem related to water, cleanliness, and sanitation. Adolescents aged 15-19 years old tend to be associated with behavior, such as alcohol abuse, bad eating habit, and lack of physical activities.[10]

Adolescents create more choices for themselves than when they were children. In addition, since eating is a social action, the existence of media social and the biggest influence come from their family. The consumption behavior of sugar, salt, and fat during this period influences someone's eating habits and contributes to the development of degenerative disease risk factors.

Methods

The design used in this research was quantitative with the observational analytic method with cross-sectional design. The research samples were counted by the OpenEpi computer program, with the criteria as stated: 14-19-year-old adolescents, living in villages, willing to be the research subjects. Based on those criteria, this research used 160 samples, and whole samples have agreed to enroll in this research and signed informed consent.

The sampling technique in this research used multistage random sampling, where the research was conducted based on the region. The first step i.e. deciding the region which is included the region of the rural area. Tulang bawang is one of regency in Lampung Province, Tulang Bawang 15 regencies, 12 of them are rural areas. From 12 rural areas, 50 % or 6 regencies were taken as the research sites, the district's choosing was decided by random sampling using Microsoft Excel. The districts chosen were Gedung Aji District, Meraka Aji District, Meraksa Aji District, Rawa Pitu District, Penawar Tama District, and Gedung Aji Baru District. In the second step, the researchers decided the schools for research locations, from those 6 districts there are 21 senior high schools, and then 50% or 10 senior high schools were chosen to be the research locations. The school chosen was decided by random sampling using Microsoft Excel.

Balanced Nutrition Guidelines from the Ministry of Health of the Republic of Indonesia 2014 were used as the reference to construct the questionnaires in this research. The questionnaire about sugar, salt, and fat (SSF) behavior consumption describes the respondents' frequency in consuming food and beverage containing sugar, salt, and fat (SSF). While the questionnaire about healthy food choices describes how the respondents will response in case healthy food and unhealthy food are provided.

The data about sugar, salt, and fat consumption behavior and healthy food choices were obtained through structured questionnaires that had been tested its validity and reliability. Questionnaire's validity test was done through Pearson test by comparing r counted and r table. If r counted is bigger than r table, the question item on the questionnaires is valid, inversely, if r counted is smaller than r table, it is invalid. In this research, the r table is 361. After conducting a validity test for each questions item, it was obtained that the results of questionnaire score for each item

SSF consumption behavior question and the food choices are more than 361, and it showed that both of the questionnaires are valid. The reliability test used Cronbach's alpha test minimal 0.60. After the reliability test was conducted, it was acquired 0.70 and 0.67. It shows that the two questionnaires are reliable. The validity and reliability test were done using SPSS 16.0 for Windows.

Those two questionnaires used the Likert Scale. Nutritional behavior is a reaction, action, or response of adolescents towards nutrition. The respondents were asked to state their opinion: Never, seldom (<3x per month), often (1-6x per week), and always (>1x per day). This classification is based on the Basic Health Research (*Riskesda*) 2014 on risk food consumption chapter. A healthy food choice is a process to decide on nutritious, healthy, and safe food to be consumed. The respondents were asked to state Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.[12]

There are two parameters at the end of the questionnaire result in this research; they are adequate and inadequate. The scoring was done by comparing the number of answers (SP) and the score expected or the highest score (SM), then times by 100%. The formula used is $N = \frac{SP}{SM} X\ 100\%$, then it was compared by average score[13]. It is adequate if score > mean, and it is inadequate id score < mean. After that, the data were analyzed and tested using the Chi-squared test, through SPSS 16.0 for Windows. This research has had ethical approval from *Komisi Etik Penelitian Kesehatan* (KEPK) (Ethical Commission of Health Research) Universitas Sebelas Maret No: 30 /UN27.06.6.1/KEP/EC/2021.

Results and Discussions

The subjects of this research were adolescents of senior high school aged 14-19 years old. Table 1 shows the respondents' characters distribution base on the genders, the number of females is bigger than males. It was caused the number of males in each school is lesser than the number of females. Based on the allowance, the average allowance of 160 respondents belonged to the low category between 5,000 IDR – 10,000 IDR /day. The amount of allowance would influence the healthy food choice in adolescents the students who have low-category allowance has chance 18.525 times to have behavior in choosing healthy snacks compared than the students who possess high-category allowance [14]. there is a significant relationship between the fast-food consumption frequencies and allowance.[15]

Table 2 is a descriptive analysis for each question item in the questionnaires in choosing healthy food which consisted of 11 questions. The first question was "I prefer to choose sweet, salty, and fatty food than fruit and vegetables". 123 of the 160 respondents disagreed; it showed that the respondents understood that consuming sweet, salty, and fatty food was bad for their health. Then, the second question "I reduce the sugar intake when making tea and choose to add honey rather than sugar", in this question, 92 respondents agreed when they make tea they prefer to choose to add honey than sugar. The respondents rather knew that honey is better than sugar. The flavonoid and phenolic acid contained in honey have important roles for health because it contains high antioxidant and anti-inflammatory. Honey has antimicrobial capacity and anti-cancer activities towards several types of tumors. In addition, antidiabetic activities are also being highlighted through the reduction of glucose, fructosamine, and hemoglobin glicosilada serum concentration. Honey also gives protection effect in the cardiovascular system

where it prevents low-density lipoprotein oxidation in the nerve system, in the respiratory system towards asthma and bacterial infection, and digestive system. Honey can be used to replace sugar because honey is healthier than sugar.[16]

The third question stated, "I prefer to drink water than ready-to-drink packaged beverages and soft drinks". In this question, 130 participants agreed. It indicated that they have understood that consuming water is healthier than ready-to-drink packaged beverages and soft drinks. The influence of carbonated beverages on the obesity case at SMA 2 Banda Aceh.[17]. The fourth question was "I prefer to avoid sweetened and colored food". 137 of 160 respondents agreed with the statement. Overall, the respondents have understood that consuming food that contained artificial sweeteners and color is unhealthy. Frequently consuming food that contained sweeteners substance causes sore throat.[18]

The fifth question was "I prefer to choose snacks with high-sodium than fruit salad", 96 of 160 respondents disagreed that they preferred to consume snacks with high-sodium than fruit salad; it showed that the respondents have known what food contained high sodium is bad for their health. Research done by Alfiana et al., (2014) and Manawan et al., (2016) obtains that there is a relationship between sodium intake and hypertension.[19,20]. The next question, the sixth question, was "I prefer to choose preserved food than fresh food". In this question, 151 respondents disagreed that they preferred preserved food to fresh food; it indicated that the respondents realized that fresh food is better than preserved food. Research shows someone who consumes preserved food –in this case, salted fish and smoked fish- can influence health when someone frequently consumes salted fish or >3 in a month increases the risk of carcinoma nasopharynx 4.2 times. Moreover, frequently consuming smoked fish or >3 in a month will increases the risk of carcinoma nasopharynx 4.7 times.[21]

The seventh question was "If I restrict fat intake, I will choose an animal-based dish than a vegetable dish". 36 of 160 respondents disagreed when they restrict fat intake, they choose the animal-based dish that plant-based dish, 43 respondents gave the neutral answer, and 81 respondents agreed that they restrict fat intake they choose the animal-based dishes than the plant-based dishes. Based on the responses, it was known that the respondents have not known or realized yet the effect of consuming animal-based dishes and plant-based dishes on their health. Consuming animal-based dish habits often happens in children in the obesity group (98%) higher compared to normal children with normal nutrition (55.7%). Consuming plant-based habits often happens in the group of children with normal nutrition status (17.3%) higher than children with obesity (1.9%). These showed that consuming animal-based dishes in a big amount or regularly can lift the weight compared to consuming plant-based dishes.[22]

The eighth question was "Processing food by boiling, steaming, or roasting is healthier than frying". 141 of 160 respondents agreed with the statement, about 71.2% of respondents understood that boiling, steaming, and roasting are good food processing. Frying food will cause a significant reduction of nutrition because frying uses high temperature, and it will break the nutrient such as protein.[23]

The ninth question was "I prefer to avoid junk food than fruit". 84 of 160 respondents agreed. This indicated that the respondents realized that fruit is healthier than junk food. The research done by Thesa et al., (2018) obtains respondents who consume junk food at medium level were 19 people, some of them

experienced obesity. It can be concluded that there is a relationship between consuming junk food with obesity in adolescents in Banda Aceh.[24]

The tenth question was "When I am eating, I take rice more than I take vegetables". 51 of 160 respondents disagreed, 36 respondents were neutral, and 73 respondents agreed. It showed that the respondents have not understood the portion of staple food and vegetables at one mealtime. Ministry of Health of Republic of Indonesia recommends in a guideline *Isi Piringku* (the contents in my plate) in a mealtime, the portion of vegetables and stable food must be at the same amount 150 grams.[25]

The eleventh question was "In a mealtime, I have to consume staple food, vegetables, dishes, and fruit". 137 of 160 respondents agreed, and it showed that the respondents have understood balanced nutrition. Mentioned in the quality of balanced nutrition and the completeness of nutrients are influenced by the several types of food consumed. This information can be applied by consuming five types of food in a day or at one mealtime. Those five groups of food are stable food, dishes, vegetables, fruit, and beverages.[26]

The results showed that 80 respondents had inadequate sugar, salt, and fat consumption behavior. From 80 respondents who had inadequate sugar, salt, and fat consumption habit, 48 (60%) respondents had inadequate healthy food choices, and 32 (40%) respondents had adequate healthy food choices. The result of the Chi-square test can be seen in table 3 where the research obtained 0.007 (<0.05). Therefore, the research was stated significant which meant H_0 was rejected and H_a was accepted. It meant there was a relation between sugar, salt, and fat consumption behavior and healthy food choices among adolescents in rural areas, and it was influenced by the Indonesian lifestyle which gets distracted by fast food and the lack of information about nutrition and brings impacts to risk food consuming habits. It also influences people around the world to consume sweetened beverages ten times higher than what is being recommended, and 86% of people consume sodium more than the safe limit.[27]

This research shows that the sugar, salt, and fat consumption behavior among adolescents belongs to the inadequate category. This is in line with Survei Konsumsi Makanan Individu (Individual Food Consumption Survey) conducted by Atmarita et al., (2016). The analysis result shows that 29.7% of citizens of Indonesia or equal to 77 million people have consumed sugar, salt, and fat more than WHO recommendation. The positive effect of consuming sugar is the contribution to make balanced energy to maintain an ideal weight[28]. However, it will be a problem if someone consumes more than what is needed; in addition, the sources of sugar come from sweetened beverages which can affect nutrition deficiency. Fat and oil are part of balanced nutrition for a healthy life. However, if the types of fat and total fat are consumed (>25% total energy) will lead to hypercholesterolemia 5.95 times compared to less consuming fat (<25% total energy).[29]

The bad eating habit is one of the factors which increase the adolescents' health risk higher. Discipline towards eating habits is one of the ways to have a healthy life and stay away from diseases. A right eating habit, according to The Ministry of Health, contains balanced nutrition with equal components; both quantity and quality, containing energy, protein, vitamin, and mineral needed to maintain health and to do daily activities in all age range and all physical conditions.

This research obtained that the adolescents with the good category for the number of healthy food choices among in the rural areas are better (82 respondents) than those who have the bad category (78 respondents). The result of this research is in line with a survey conducted in 2017. The survey states that the awareness of the healthy lifestyle has increased where health factor becomes one of three big crucial factors for food preferences after price and taste. Indonesian customers show a willingness to pay more to get healthy food.[30] Several things can influence the food choices among adolescents, some of them are the familiarity, convenience, and comfort of food, the nutrition fact, the food appeal, the value for money, the food restriction.[31]

Conclusion

This research concluded that there is a relationship between sugar, salt, and fat consumption behavior and healthy food choices among adolescents in rural areas. A good sugar, salt, and fat consumption behavior will lead to healthy food choices.

Declaration Section

This research does have any personal interests either in finance or organization surrounds which can influence the research. This research has accepted the ethical approval from Komisi Etik Penelitian Kesehatan (KEPK) (Ethical Commission of Health Research) Universitas Sebelas Maret no: 30 /UN27.06.6.1/KEP/EC/2021. All the respondents have declared the involvement approval in this research by signing informed consent. This research has been approved by the writer to be published. The data can be accessed under writer's permission. The finance used to publish this research was sourced by the main writer.

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Table 1. Distribution of characteristics of respondents

Variable	N	%
Age		
Early adolescents 11-13	-	
Middle adolescents 14-16	72	45%
Late adolescents 17-20	88	55%
Gender		
Female	121	76%
Male	39	24%
Allowance		
Low (< 10.000)	78	49%
Medium (10.000-15.000)	74	46%
High (>15.000)	8	5%

Table 2. Descriptive analysis of healthy food choices questionnaire

Question	Choice				
	SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)
I prefer to choose sweet, salty, and fatty food than fruit and vegetables	59 (36,9%)	64 (40,0%)	18 (11,2%)	16 (10,0%)	3 (1,9%)
I reduce the sugar intake when making tea and choose to add honey rather than sugar	3 (1,9%)	40 (25%)	25 (15,5%)	71 (44,4%)	21 (13,1%)
I prefer to drink water than ready-to-drink packaged beverages and soft drinks	6 (3,8%)	12 (7,5%)	12 (7,5%)	60 (37,5%)	70 (43,8%)
I prefer to avoid sweetened and coloured food	5 (3,1%)	11 (6,9%)	7 (4,4%)	63 (39,4%)	74 (46,2%)
I prefer to choose snacks with high sodium than fruit salad	21 (13,1%)	75 (46,9%)	27 (16,9%)	31 (19,4)	6 (3,8%)
I prefer to choose preserved food than fresh food	60 (37,5%)	91 (56,9%)	3 (1,9%)	4 (2,5%)	2 (1,2%)
If I restrict fat intake, I will choose an animal-based dish than a vegetable dish	1 (6%)	35 (21,9%)	43 (26,9%)	69 (43,1%)	12 (7,5%)
Processing food by boiling, steaming, or roasting is healthier than frying	70 (43,8%)	71 (44,4%)	13 (8,1%)	4 (2,5)	2 (1,2%)
I prefer to avoid junk food than fruit	11 (6,9%)	41 (25,6%)	24 (15,0%)	61 (38,1%)	23 (14,4%)
When I am eating, I take rice more than I take vegetables	7 (4,4%)	44 (27,5%)	36 (22,5%)	53 (33,1%)	20 (12,5%)
In a mealtime, I have to consume staple food, vegetables, dishes, and fruit	1 (6%)	7 (4,4%)	15 (9,4%)	69 (43,1%)	68 (42,5%)

*SD (Strongly Disagree), D (Disagree), N (Neutral), A (Agree), SA (Strongly Agree)

Table 3. Analysis relationship of sugar, salt, and fat consumption behaviour towards healthy food choices in adolescents in rural areas (Chi-Square Test)

		Healthy Food Choices							
		Inadequate		Adequate		Total		x^2	Value p
		n	%	n	%	n	%		
Behavior of consumption of SSF	Inadequate	48	60	32	40	80	100	7,230	0,007
	Adequate	30	37	50	63	80	100		
Total		78	49	82	51	160	100		

The impact of smartphone uses on adolescent sleep quality during the COVID-19 pandemic in Surabaya, Indonesia

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Abstract

Adolescents in the era of the COVID-19 pandemic, often spend time using their smartphones and disturb their sleep pattern. The purpose of this study was to determine the relationship between smartphone use and adolescent's sleep quality during the COVID-19 pandemic. This study used a correlation design with a cross-sectional approach. This research was conducted on adolescents in the city of Surabaya. The population in this study were adolescent aged 16-18 years old. The samples were 339 adolescents which obtained by cluster random sampling technique. The independent variable was the smartphones use, while the dependent variable was the sleep quality. The instruments were the smartphone use questionnaire and the PSQI (Pittsburgh Sleep Quality Index) questionnaire. The data was collected by online questionnaire and then analysed by Spearman Rho test with a significant degree of $p < 0.05$. During the COVID-19 pandemic almost 90% adolescent used smartphone at a high level and 90% of them also experienced poor sleep quality. There was a strong relationship between smartphone use and sleep quality in adolescents ($p = 0.000$; $r = 0.636$). In conclusion, extensive use of smartphones will reduce the sleep quality of adolescents because adolescents' high intensity increasing sleep latency and causing insomnia. The role of parents is needed to control the use of smartphones in adolescents.

Keywords: adolescents, smartphones, sleep quality, sleep latency, duration of use

Background

Adolescence is a period of self-transition from children to adults who experience development in all aspects of physical, cognitive, and psychological. Adolescents experience many changes in emotions, bodies, interests, behavior patterns and are also full of problems during adolescence. During the COVID-19 pandemic, adolescents have health problems in the form of poor sleep quality.[1] One of the causes of decreased sleep quality among adolescents is the intensity of smartphone use.[2] Poor sleep quality in adolescents can have an impact on health problems such as obesity and can interfere with development in adolescents.

According to WHO,[3] adolescents is 1.2 billion or 18% of the world's population. In the September 2020, Indonesia has 270.20 million or about 10.88% of the population with a total age group of 8-23 years. In 2020 in East Java. especially in Surabaya, the largest population is the age group 8-23 years as much as 25.79% of the total 2.874.314 people.[4] Between January-May 2020, 48.5% of 33 million people in the world, with an age range of 18-24 years having low sleep quality during a pandemic and 37% taking longer to fall asleep. Adolescent sleep quality using the SDSC (Sleep Disturbances Scale for Children) method is in the poor category of 73.4%.[5]

Sleep quality is influenced by environmental, physical, activity and lifestyle conditions.[6] The use of smartphones in the era of the COVID-19 pandemic has become an unavoidable phenomenon, including for adolescents who participate in online learning.[7] During online learning, adolescents stay up late to do schoolwork, look for information about school lessons and watch videos about their school lessons. Adolescents also carry out online activities such as playing social media and playing games which sometimes cannot be controlled in managing time when using smartphones so that other activities in daily life are neglected and moreover the quality of sleep becomes messy. Activities carried out by adolescents when staying up late, 50% playing smartphones, 37% doing assignments and 13% doing other activities.[8] The effects of staying up late can cause poor sleep quality. If this happens continuously then the quality of sleep becomes inadequate and can cause physiological and psychological balance disorders.

According to Spielman "The 3P's of Insomnia", there are 3 factors that cause sleep pattern disturbances, namely predisposing factors, precipitation factors and perpetuation factors. The most influential factor on sleep quality is the perpetuation factor, which is a habit that is carried out continuously in the use of smartphones and can cause an irregular sleep schedule that will worsen health, especially sleep quality in adolescents. The study was to determine the relationship between smartphone use and adolescent sleep quality in the city of Surabaya during the COVID-19 pandemic.

Methods

This study used a descriptive correlational design with a cross-sectional approach. The population in this study was adolescents in Surabaya, aged 16-18 years old and the target population is students in SMA Negeri 5, SMA Negeri 19 and SMA Negeri 22 as many as 2.212 people. The research sample was 339 adolescents who were obtained through cluster random sampling. The independent variable was the use of smartphones while the dependent variable was the quality of sleep. Data were collected through an on-line questionnaire about smartphone use and a PSQI

(Pittsburgh Sleep Quality Index) questionnaire. Data collection was carried out in August 2021 by distributing google form questionnaires. The data than was analyzed using the Spearman Rho statistical test with a significant degree of $p < 0.05$. This research had been ethically tested and approved by the Ethics Committee of the Faculty of Nursing with the number: 2338-KEPK.

Results and Discussions

Respondent characteristics

Based on table 1, the distribution of respondents from SMA Negeri 5 Surabaya was 104 respondents (30.7%), SMA Negeri 19 Surabaya was125 respondents (36.9%) and SMA Negeri 22 Surabaya was 110 respondents (32.4%). Most respondents are female, 239 respondents (70.5%) and aged 18 years was 125 respondents (36.9%).

Adolescent smartphone use during COVID-19 pandemic

Table 2 shows that the majority, 305 respondents (90%) used smartphone during the COVID-19 pandemic was at a high level.

Adolescent sleep quality during COVID-19 pandemic

Based on table 3, it can be explained that almost all of them are adolescents, 305 respondents (90%) experienced poor sleep quality.

The analysis of the relationship between smartphone use and teenage sleep quality

The results of the Spearman rho test in table 4 show that there was a relationship between smartphone use and sleep quality in adolescents with $p = 0.000$, with a strong relationship level ($r = 0.612$). These results indicate that the higher the use of smartphones, the worse the sleep quality.

Adolescent's smartphone use during the covid-19 pandemic

The use of smartphones in adolescents during the COVID-19 pandemic increased smartphone use. According to Nurwulan[9] adolescents are addicted to using smartphones and spend a lot of time using them. The feeling of addiction in using smartphones in adolescents, especially when the COVID-19 pandemic is triggered by boredom and the influence of peers who generally use social media that is currently being used. This addiction is difficult to get rid of because there will always be interesting things that should be discussed with their peers both about themselves and the characters they idolize. Adolescents use smartphones to access the online learning system provided by the school. The hectic schedule of schoolwork makes adolescents rarely interact with their peers and can only access social media in the late afternoon and into the evening. Adolescents use smartphones every day when they have free time such as in the bedroom, before sleeping, wake up, while eating, before eating, before starting online school, after finishing online school, when playing with friends in the neighborhood, even when with family and weekends. Habits carried out by adolescents today cause them to be dependent on smartphones.

Smartphones are mobile phone devices equipped with modern capabilities such as internet and video.[10] More sophisticated, the ease and affordability of smartphones causes smartphones to become an inseparable part of most adolescents' lives. Smartphones have now been used anywhere and anytime either day or night[11]. The sophistication provided by smartphones makes it easy for adolescents to find subject matter because it is faster and saves time. During the COVID-19 pandemic,

adolescents also use smartphones to access online learning applications such as ZOOM and Google Meet. The sophistication of other smartphones is also found in various social media applications that can be accessed by adolescents. Adolescents tend to be sensitive and easily influenced by friends, so that it will try not to miss the latest information which is usually sourced from social media. Therefore, they use a lot of social media, especially those that are currently being used, especially by their school friends. They feel a moral obligation to support their friend as well as by liking, comment, or share their friends' posts or content. There are times when adolescents ask their friends personally to like or comment on the content, so it doesn't look sad. This has become an unwritten agreement among adolescents, so they are forced to use social media even when they don't want to use it just to support their friends.[9]

The current era of the COVID-19 pandemic, smartphones are certainly the main thing in communication, adolescents are no exception. The ease and convenience of using a smartphone has a good impact if it is used wisely by adolescents, such as providing the latest information that is happening and expanding the network of friends. The age of the most vulnerable smartphone users is the age of adolescents because nowadays smartphones have become the main means of adolescents in interacting with peers and become one of the means of self-actualization. The role of parents is very much needed for adolescent smartphone users. Parents must provide special knowledge about policies in terms of accessing smartphones and the internet. Giving knowledge about the use of smartphones should be done as early as possible so that adolescents can understand what the positive and negative impacts are when they already have a smartphone. Parents must have strict rules for adolescents related to the use of smartphones so that adolescents can learn to control themselves in using smartphones. The way parents deal with adolescents from smartphone addiction is by way of mentoring, supervision, and open communication. Efforts to avoid smartphone addiction in adolescents, every parent, nurses and the community, should take some precautions such as minimizing the use of cell phones in adolescents, and increasing the role of parents by implementing optimal supervision and assistance, and open communication between youth and parents. Nurses need to continue to increase parental involvement in efforts to prevent smartphone addiction in adolescents.[12]

Adolescent's Sleep Quality During the COVID-19 Pandemic

Based on this study, the sleep quality of adolescents during the COVID-19 pandemic worsens. This is evidenced by the results of research showing that some adolescents have poor sleep quality while others have good sleep quality. In accordance with Spielman's theory, a single factor is not the only cause of sleep problems. Physiological factors, psychological and environmental factors can change the quality and quantity of sleep, including physical illness, medicines and lifestyle[13]. The adolescents experience mild insomnia due to doing homework at night, chat with friends on social media, browsing and downloading things related to hobbies and pleasures, as well as online gaming activities. Adolescents experience sleep disturbances because of difficulty initiating sleep, difficulty maintaining sleep or waking up too quickly. Poor sleep quality in adolescents can have an impact on health problems such as obesity and can interfere with development in adolescents.

Sleep disorders that often occur are insomnia which is indicated by symptoms of difficulty falling asleep or maintaining sleep and waking up too early.[14] Sleep disturbance refers to several behaviors that have a negative impact such as waking up late at night, breathing uncomfortably coughing or snoring loudly and having

nightmares and pain.[15] In the adolescent there is a change in sleep patterns where the shift in sleeping time becomes late at night. The National Sleep Foundation recommends that the appropriate sleep duration for adolescents aged 14-17 years should be between 8-10 hours per day.[16] Entering the stage of adolescent development, sleep time for adolescents to be reduced. Often, nap time must be sacrificed because of the many activities and tasks during online learning. Drowsiness during the day is the most frequent sleep behavior and is always experienced by adolescents. Sleepiness during the day is a sleep problem that is quite common in adolescents. Based on the results of filling out the PSQI questionnaire, adolescents are often sleepy when carrying out online learning, while eating and doing other activities. This is because most adolescents do not get enough sleep according to the recommendations (8-10 hours per night) so this is the cause of most adolescents have a feeling of sleepiness during the day. Lack of hours of sleep-in addition to causing poor sleep quality in adolescents. can also cause the physical condition of adolescents to decline.

The relationship between smartphone uses and adolescent sleep quality in the city of Surabaya during the COVID-19 pandemic

The results showed that most of the adolescents in used their smartphones at a high level. In addition, most also experience poor sleep quality as a result of high levels of smartphone use. Some respondents use smartphones with high levels but have good sleep quality, this may be because they are able to set the time when to use a smartphone and when it is time to sleep so that they sleep on time. There is a relationship between smartphone use and sleep quality. Mostly respondents who use smartphones with high levels of intensity have poor sleep quality, while respondents with moderate and low levels of smartphone use have good sleep quality. Adolescents have trouble getting up in the morning because they use smartphones and stay up too late. This causes the hours of sleep that adolescents have to be reduced. Research conducted by Hysing[17] states that using a smartphone for a long time can directly reduce the time spent sleeping. Smartphone users prefer to browse mobile websites, playing games or playing social media before going to bed. This can cause difficulty in starting sleep because adolescents delay their bedtime to open notifications on their smartphones and return to playing their smartphones until late at night. Excessive smartphone use can affect the quality of sleep and individual conditions both physically and psychologically.

Potter and Perry[18] explained, there are several factors that affect sleep. One of them is lifestyle. During the COVID-19 pandemic, the lifestyle of today's people, especially adolescents, cannot be separated from smartphones and causes them to use them all the time. In accordance with the smartphone use questionnaire which shows that almost all respondents use smartphones all the time, it causes the sleep process to be disrupted due to adolescents who focus on playing smartphones until late at night. Latency is the duration from going to sleep to falling asleep.[19] Individuals with good sleep quality take less than 15 minutes to enter the next stage of complete sleep, while sleep duration is the time the individual falls asleep until he wakes up in the morning without waking up in the middle of the night.[20] Adolescents with poor sleep quality, is indicates that adolescents were too much at home to do online schoolwork and play smartphones, so most of the time they slept less. Adolescents use smartphones more often, especially when online learning takes place to access learning media that has been provided by the school[21]. Excessive smartphone users have a higher risk of having sleep disorders and affecting the quality of one's sleep. The use of smartphones at bedtime can affect the quality of sleep for the worse, sleep efficiency decreases, and the onset of sleep latency becomes longer.

Smartphones can be habit-forming, in the form of checking habits, repeated checks and speed of accessing various content using smartphones can affect the increase in smartphone use.

The use of smartphones with high intensity can result in adolescents having closer relationships with their friends in the online world compared to adolescents' relationships with friends in the surrounding environment. This causes adolescents to be unable to control their habits in using smartphones and tend to constantly check their smartphones. The higher the habit of adolescents in using smartphones before going to bed, the shorter the duration of sleep they get, the longer the sleep onset latency and pre-sleep arousal (PSA)[22]. Adolescents who tend to access social media before going to bed can interfere with their sleep needs and are at risk of insomnia.

Spielman's explains, the cause of difficulty sleeping at night is caused by 3 factors. They are predisposing conditions (conditions inherent in individuals such as gender, age, genetics, lifestyle, physical and mental health conditions), precipitating circumstances (precipitating events that are usually traumatic), and perpetuating factors (shifts in cognitive and behavioral patterns that exacerbate insomnia). The frequency and duration of excessive use of smartphones causes adolescents to experience sleep disorders so that they lack rest and cause physical health conditions to decline. Adolescents access the internet through smartphones every day, especially at night. This allows the teenager to have poor sleep quality. In this case, with various negative impacts that occur in the use of smartphones, one of which is the quality of sleep, it is hoped that adolescents or someone can control themselves, so they are not too intense in using smartphones.

The habit of using smartphones will start to reduce sleep time and cause adolescents to find it difficult to start sleeping, being late in waking up in the morning and not meeting the need for sleep. This is in accordance with the results of the questionnaires that have been filled in where many respondents find it difficult to wake up in the morning or only have time to sleep a few hours before getting up and starting their usual activities. One of these overuses is that adolescents continue to prepare their smartphones in conditions that have sufficient power to be used every day. This condition will also affect the quality of sleep because a lot of time is used to continuously operate the smartphone. Positive and negative activities in the use of smartphones will become blurred and mixed until adolescents find it difficult to distinguish between the two. Adolescents do not find it strange to do negative things like checking their smartphones, passionate about using smartphones excessively. Likewise with positive activities such as making smartphones as a means of learning and doing assignments, make smartphones as a means to reduce stress, fatigue, anxiety and experience various adverse social and physical effects. The difficulty of adolescents to identify the benefits of these two activities causes them to be lost and dissolved in using smartphone.

Conclusion

The use of smartphones in adolescents in the city of Surabaya during the COVID-19 pandemic causes poor sleep quality. Adolescents use smartphones for online learning, playing games and accessing social media and causing late night smartphone use, resulting in poor sleep quality. Adolescents must be able to control themselves not to use smartphones at least 1-2 hours before going to bed because using smartphones before going to bed can cause poor sleep quality. The role of

parents is also very important to provide firm boundaries for adolescents regarding the use of smartphones before bedtime.

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Table 1. Respondent Characteristics

Characteristic	Criteria	n	%
Gender	Female	239	70.5
	Male	100	29.5
	Total	339	100
Age	16	103	30.4
	17	111	32.7
	18	125	36.9
	Total	339	100
School name	SMA Negeri 5	104	30.7
	SMA Negeri 19	125	36.9
	SMA Negeri 22	110	32.4
	Total	339	100

Table 2. Adolescent Smartphone Use during COVID-19 Pandemic

Smartphone use	n	%
Low	10	2.9
Middle	24	7.1
High	305	90.0
Total	339	100

The analysis of the eating behavior impact and nutritional knowledge with college students' nutritional status during the online lecture in the COVID-19 pandemic

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Abstract

The college student is a group of people who are at risk with unhealthy eating behavior. Knowledge of nutrition is also the cause of nutritional problems. The Covid-19 pandemic has caused changes in eating behavior that have an impact on nutritional status. This research aims to analyze the impact of eating behavior and nutritional knowledge on the nutritional status of college students during the online lecture in the Covid-19 pandemic and to examine the probability of the dependent variable to be able to predict the independent variable. The method used in this research was analytic observational with a cross-sectional design with multistage cluster random sampling as many as 220 respondents. The eating behavior data was measured using the Dutch Eating Behavior Questionnaire (DEBQ). The nutritional knowledge data was measured using a questionnaire of the research by Florence in 2017. The nutritional status data was measured according to BMI and obtained through measurement of body weight (kg) and height (m^2). The result of the bivariate analysis using the Pearson Rank Spearman Test showed that there was a significant positive relationship between eating behavior and college students nutritional status ($p < 0.05$), and $r = 0.265$ or sufficient, however, the nutritional knowledge had an insignificant positive relationship with the college student nutritional status ($p > 0.05$), and $r = 0.095$ or very feeble. The result of the multivariate analysis with multinominal logistic regression showed that the variable of eating behavior and nutritional knowledge affected the nutritional status by 10.6%. It was concluded that bad eating behavior which had an impact on the nutritional status, however, the level of nutritional knowledge had no impact on the nutritional status. By this research, the authors hope that students can maintain eating behavior during online lectures, hence students can have normal nutritional status during the Covid-19 pandemic.

Keywords: COVID-19, college students, eating behavior, nutritional knowledge, nutritional status

Background

The college student is one of the productive age groups that is still classified as teenagers. According to the World Health Organization (WHO), the adolescent age group is 10-24 years old and the average college student age ranges from 18 to 24 years.[1] Nutritional status is one of the indicators in determining the degree of individual health which is the result of food intake and energy expenditure from physical activity that is adjusted to individual needs.[2] The assessment of nutritional status obtained from anthropometric measurements by measuring weight and height.[3]

The prevalence of nutritional status according to the Body Mass Index (BMI) in the college student age group >18 years in West Java still become a concern, where the nutritional status is underweighted (9.25%), overweight (13.66%), and obesity (23%). The prevalence of nutritional status according to BMI of the >18-year age group in Cimahi City has a higher prevalence than the average prevalence in West Java, that are underweight (9.54%) and obesity (24.87%) nutritional status.[4] Indonesia is currently going through a Corona Virus Disease 2019 (COVID-19) pandemic so the Government has decided to implement a large-scale social restriction so that they carry out various activities only from home, including the online lecture.[5]

A college student is a group that is at risk of experiencing changes in eating behavior so that it has an impact on the nutritional status with overweight problems.[6] In general, obese people try to restrict their food and drink (restrained eating), where those individuals tend to hold hunger longer than normal people. A college student is also a group that is at risk of experiencing emotional eating due to the pressure during the lectures.[7] The individual eating behavior will affect a person's nutritional status, this is in line with the previous research which states that there is a significant relationship between eating behavior and nutritional status in adolescents ($p = 0.01$).[8] Several studies have shown behavioral changes during the COVID-19 pandemic, behavioral changes such as a decrease in physical activity (38%), an increase in the frequency of meals and snacks, and an increase in consumption of unhealthy food, when compared to the days before the COVID-19 pandemic.[9]

Another factor that can also be related to college student eating behavior is nutritional knowledge. The less of nutritional knowledge is the cause of nutritional problems and changes in eating habits.[10] Nutritional knowledge is something that is known related to food and nutrient in order to achieve optimal health.[2] The nutrition knowledge is very essential for every individual to understand, especially for college students, for the reason that low nutrition knowledge will have an impact on bad eating behavior, and have the potential to produce abnormal nutritional status.[11] Therefore, this research aims to analyze the impact of eating behavior and nutritional knowledge on the nutritional status of college students during online lectures in the COVID-19 pandemic and to examine the probability of the dependent variable to be able to predict the independent variable

Methods

This research is an analytical observational study with a cross-sectional design and was implemented in July 2021. The population in this research was college students aged 18 – 24 years at STIKES Jenderal A. Yani Cimahi, with a sample size of 220 respondents, taken using a multistage cluster random sampling. The selection of the

sample was carried out in accordance with inclusion criteria, that is college students aged 18 to 24 years, currently located in Cimahi, currently undergoing online lecture, with Bachelor and D4 education levels. The exclusion criteria in question were final year student and were ill at the time of the research so they were unable to answer the researcher's questions and take the anthropometric measurement. Anthropometric measurement was measured using a microtoice and digital weighing scale.

The data retrieval of eating behavior and knowledge of nutrition was taken using a google form after measuring weight and height. Data collection is assisted by one of the enumerators who is a graduate of the Bachelor of Applied Nutrition. All previous research subjects were asked for their approval to be included in the research in the form of written informed consent. The data of eating behavior was obtained using the Dutch Eating Behavior Questionnaire (DEBQ) which consists of 33 items, namely 13 questions regarding emotional eating, 10 questions about external eating, and 10 questions about restrained eating.[7] This questionnaire uses a Likert scale assessment with each question item consisting of five answer choices, if the answer choices are 1 = never, 2 = rarely, 3 = occasionally, 4 = often and 5 = always. The result of the measurement of eating behavior, they were categorized into bad and good, it was categorized bad if the score $\geq$ median and good if the score < median.

Nutritional knowledge data was obtained using a questionnaire adapted to the results of Florence's research in 2017. This questionnaire consists of 20 questions in the form of a choice of true or false statements. The questionnaire contains 6 indicators, namely the benefit of eating, nutritional status, food containing substances needed by the body, portion and diet, the role of nutrients in a certain disease, and the content of nutrients in food.[12] The measurement of the nutritional knowledge was then categorized into 3 categories: it is less if it has a score (<60%), sufficient (60-79%), and good (80-100%). Before these measuring tools are used in actual research, it is necessary to test the validity and reliability. The validity and reliability test of the questionnaire was conducted on 50 college students at another STIKES in Cimahi, that is STIKES Budhi Luhur Cimahi. According to the result of the research, the test result was obtained from 20 questions with a Cronbach Alpha Coefficient value of 0.878, and the content validity of each question was declared valid with a (p-value <0.05).

Eating behavior and knowledge of nutrition were processed using Ms. Excel 2016. The data that has been collected is then analyzed using the bivariate test, namely Pearson Rank Spearman, since the data is not normally distributed (p-value > 0.05), and the multivariate test uses Multinominal Logistic Regression, in consideration of the dependent variable that was being researched has more than two categories. The data were processed using the program of SPSS version 23, hence the significance will be valuable if the p-value < 0.05. The data was processed using the SPSS version 23 program. The research was implemented after being declared ethically appropriate by the Health Research Ethics Commission of STIKES Jenderal A. Yani Cimahi numbers: 01/KEPK/IV/2021.

Results and Discussions

Characteristics of Respondents

In Table 1 that shows the characteristic of respondents according to age, gender and basic characteristic of the research subject. The result showed that the age of college students ranged from 18-23 years with the criteria for college students is the most

respondents aged 20 years (39.5%), and the least being respondents are 23 years old (2.3%). Most of the respondents are female, which is around 81.8% (Table 1).

The result of the research was in accordance with the basic characteristic of the subject, that is most of the respondents had bad eating behavior (55%) (Table 1). Eating behavior is essential in the aspect of life because it can affect health status in the future as the result of unhealthy eating behavior such as consuming food that less of nutrient, skipping meals, and irregular eating pattern has been proven to cause various health problems and malnutrition.[13]

In accordance with the characteristic of the level of nutritional knowledge, it shows that most of the respondents have sufficient knowledge of nutrition (58.2%) and the less of nutritional knowledge is only around 7.3% (Table 1). The knowledge of nutrition is expected to increase a person's ability to develop the individual capacity to be able to choose the type of food ingredients so that nutritional adequacy is fulfilled and can improve a person's health status.[14]
The classification of nutritional status of research subject mostly had normal nutritional status (63.3%), overweight (7.7%), and obesity (16.8%) (Table 1). The nutritional status of college students aged <18 was classified according to BMI/U, and the college student aged >18 years used BMI.[11]

The analysis of the eating behavior impact with nutritional status
According to the result of the cross-tabulation in Table 2 that shows the respondents with normal nutritional status tend to have good eating behavior that is equal to 30.5%, however, the respondents who have bad eating behavior have an obesity nutritional status of around 13.2%. Eating behavior is defined as a person's normal behavior related to eating habits, behavior in choosing food, types of processed food, and the amount of consumption.[15]

Several aspects of eating behavior assessed in this research are emotional eating, which is eating as a response that expresses a form of emotion such as fear, anxiety, and anger, then external eating, which is eating in response to food stimulation regardless of the internal condition of hunger and satiety, and then restrained eating which focuses on psychological side effects from a diet that produces a tendency to overeat, where uncontrolled eating behavior can make a person tend to choose food that is high in energy and fat.[16,17,18] This eating behavior, if it is continuously implemented will cause a significant increase in weight so that it becomes overweight or obesity.[18,19]

The results of the bivariate analysis with the Pearson Rank Spearman Test showed that there was a positive relationship between eating behavior and college students' nutritional status during online lectures in the Covid-19 pandemic (p = 0.000), and the value of r = 0.265 (Table 3). The result of multivariate analysis with multinominal logistic regression showed that the predictor of bad eating behavior has the chance of 3.680 times to have a very thin nutritional status (OR=3.680). Meanwhile, bad eating behavior has the chance of 0.711 times to have a nutritional status with the overweight (OR=0.711) (Table 4). This result is in line with the previous research which stated that there was a significant relationship between eating behavior and nutritional status in adolescents (p=0.01).[8] Another research also stated that there was a significant relationship between binge eating behavior and overweight nutritional status in college students during the Covid-19 pandemic (P=0.004) OR=1.26 with an overweight percentage of 15.3%.[20] There was an alteration in consumption pattern among the college students during the Covid-19

pandemic, that is becoming more frequent in snacking and eating uncontrollably.[21] During the Covid-19 pandemic, there was an alteration in eating behavior, such as an increase in the frequency of eating and snacking, as well as the frequency of consuming unhealthy food, when compared to the days before the Covid-19 pandemic.[9]

The analysis of the nutritional knowledge impact with nutritional status

According to the result of the cross-tabulation in Table 3, it shows that the respondents with normal nutritional status tend to have sufficient nutritional knowledge, which is 35.9%, however, the respondents who have less nutritional knowledge have obese nutritional status, which is 3.2%. The result showed that most of the college students had sufficient and good knowledge of nutrition, respectively around 58.2% and 34.5%, hence it can be said that most of the college students already had knowledge about nutrition. The less of nutritional knowledge is the cause of nutritional problems and changes in eating habits.[10]

The result of the bivariate analysis with the Pearson Rank Spearman Test showed an insignificant positive relationship between nutritional knowledge and nutritional status of college students during the online lecture in the Covid-19 pandemic ($p = 0.160$), and the value of $r = 0.095$ (Table 3). The result of multivariate analysis with multinominal logistic regression showed that the predictor of nutritional knowledge is less the chance 0.185 times to have a very thin nutritional status (OR = 0.185). Meanwhile, the less of nutritional knowledge is 0.367 times more likely to have a nutritional status with the overweight (OR=0.367) (Table 4). Overall, the eating behavior and nutritional knowledge affects the nutritional status by 0.106, or it can be said that the tested variable affect the nutritional status 10.6% and 89.4% by another factor (Table 4). Another research also shows that there is no significant relationship between attitudes and nutritional status of adolescents during the Covid-19 pandemic with a p value = 0.952 ($p > 0.05$).[22] The result of this study is also in line with the other research which states that there is no significant relationship between knowledge of balanced nutrition and college student body mass index.[23] However, the result of this research was best compared to another research that stated that there was a significant relationship between knowledge about balanced nutrition and the nutritional status of female students $p = 0.012$ and the value of $r = 0.324$, which showed a low close relationship and a positive pattern. The average value of knowledge about balanced nutrition in these college students is categorized as good with an average classification of normal nutritional status.[24] The low knowledge of nutrition will have an impact on bad eating behavior and have the potential to produce abnormal nutritional status.[11]

Conclusion

There is a significant influence between eating behavior and college students' nutritional status during the online lecture in the Covid-19 pandemic, with a sufficient level of closeness. The predictor of bad eating behavior has a chance of 3.680 times to have a very thin nutritional status, and the predictor of bad eating behavior has 0.711 times to have a nutritional status with overweight. Meanwhile, there is no significant impact between nutritional knowledge and college students nutritional status during the online lecture in the Covid-19 pandemic, with a very feeble level of closeness. The predictor of less nutritional knowledge is 0.185 times more likely to have a very thin nutritional status, and the predictor of the less of nutritional knowledge is 0.367 times more likely to have an overweight nutritional status. Overall, the aspect of eating behavior and nutritional knowledge can affect

the nutritional status by 10.6% and 89.4% are influenced by another factor. It is better for the college student during online lectures to change their eating behavior into healthy eating behavior so that they are able to prevent the occurrence of the very thin nutritional status and the overweight during the Covid-19 pandemic.

Declaration Section

This research has received ethical approval from the Health Research Ethics Commission of STIKES Jenderal A. Yani Cimahi numbers: 01/KEPK/IV/2021 and there is an agreement to participate as a respondent in the form of informed consent. The researchers agree to the publication of this research paper for academic purposes. Willing to submit all relevant data and materials, while maintaining the necessary confidentiality and anonymity. All funding for publication comes from personal expenses. The researchers would like to thank STIKES Jenderal A. Yani Cimahi who has given permission so that this research can be implemented, fellow students of STIKES Jenderal A. Yani Cimahi who have been willing to be respondents in this research, and my enumerator who has been willing to assist in this research. The authors fully contribute to the manuscript written in this section. The researchers agree to publish part of the text, table, and original publication that has been properly referenced.

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Table 1. The characteristic of respondents according to age, gender and basic characteristic of the research subject

Characteristics	N	%
Age		
18 years	24	10.9
19 years	58	26.4
20 years	87	39.5
21 years	40	18.2
22 years	6	2.7
23 years	5	2.3
Gender		
Male	40	18.2
Female	180	81.8
Eating behavior		
Good	98	44.5
Bad	122	55.5
Nutritional knowledge		
Good	76	34.5
Sufficient	128	58.2
Less	16	7.3

Table 2. The relationship between eating behavior and nutritional status of college student during online lecture in the covid-19 pandemic

Eating Behavior	Nutritional Status										Total		p- value	r
	Very Thin		Thin		Normal		Overweight		Obese					
	n	%	n	%	n	%	n	%	n	%	n	%		
Bad	5	2.3	4	1.8	72	32.7	12	5.5	29	13.2	122	55.5	0.000	0.265
Good	10	4.5	8	3.6	67	30.5	5	2.3	8	3.6	98	44.5		

Table 3. The relationship between nutritional knowledge and nutritional status of college student during online lecture in the covid-19 pandemic

Nutritional knowledge	Nutritional status										Total		p- value	r
	Very thin		Thin		Normal		Overweight		Obese					
	n	%	n	%	n	%	n	%	n	%	n	%		
Less	0	0	0	0	9	4.1	0	0	7	3.2	16	7.3		
Sufficient	10	4.5	8	3.6	79	35.9	11	5.0	20	9.1	128	58.2	0.160	0.095
Good	5	2.3	4	1.8	51	23.2	6	2.7	10	4.5	76	34.5		

Table 4. Results of multinominal logistic regression analysis

Predictor	p	OR	CI 95%		Nagelkerkel R Square
			Lower	Upper	
Nutritional status					
Very thin					
Eating behavior=bad	0.072	3.680	0.890	15.221	
Eating behavior=good	.	.	.	.	
Nutritional knowledge=less	0.172	0.185	0.016	2.083	
Nutritional knowledge=sufficient	0.815	0.837	0.188	3.723	
Nutritional knowledge=good	.	.	.	.	
Thin					
Eating behavior=bad	0.711	1.257	0.375	4.215	
Eating behavior=good	.	.	.	.	
Nutritional knowledge=less	0.760	0.791	0.176	3.565	
Nutritional knowledge=sufficient	0.657	0.733	0.186	2.891	
Nutritional knowledge=good	.	.	.	.	0.106
Normal					
Eating behavior=bad	0.198	1.922	0.710	5.198	
Eating behavior=good	.	.	.	.	
Nutritional knowledge=less	0.040	0.243	0.063	0.939	
Nutritional knowledge=sufficient	0.853	1.111	0.366	3.374	
Nutritional knowledge=good	.	.	.	.	
Overweight					
Eating behavior=bad	0.557	0.711	0.227	2.221	
Eating behavior=good	.	.	.	.	
Nutritional knowledge=less	0.212	0.367	0.081	1.744	
Nutritional knowledge=sufficient	0.676	1.300	0.379	4.463	
Nutritional knowledge=good	.	.	.	.	

Notes:
1. The reference category is: Obese
2. This parameter is set to zero because it is redundant

Husband's knowledge of signs and symptom of cervical cancer: a phenomenological study

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Abstract

Cervical cancer is still a major health problem, especially in developing countries. The incidence of cervical cancer is reported to be around 80% in developing countries. The high rate of morbidity and mortality is inseparable from the factor of limited knowledge, lack of awareness and concern for cervical cancer owned by the husband, including the signs and symptoms of the disease experienced by the wife. This limited knowledge and awareness causes delays in the diagnosis and treatment of the disease. So that women are diagnosed at an advanced stage. This study aims to explore how the husband's understanding of the signs and symptoms of cervical cancer experienced by his wife. This study uses a qualitative method with a phenomenological approach. The population in this study were husbands and wives who had cervical cancer. Participant recruitment using purposive sampling technique. 10 participants.Method of data collection using in-depth interview techniques and using semi-structured questions that have been made previously. The stages of the data analysis process carried out in this study are according to the steps of Colaizzi. This study found 4 themes: Cervical Cancer; Signs and Symptoms, Husband's perception towards wife's disease at that time, Husband's knowledge after wife suffered from cervical cancer and Cervical cancer needs treatment. In conclusion, the phenomenon of the experience of a husband who has a wife with cervical cancer provides a different experience for each husband. In this study it was found that all participants had very limited knowledge about cervical cancer, this of course could encourage nursing institutions to develop and function the tridharma of higher education, one of which is community service. Where this community service is carried out by providing health education about cervical cancer, so that people have good knowledge about cervical cancer.

Keywords: husband's knowledge, sign and symptom, cervical cancer

Background

Cervical cancer is still a major health problem, especially in developing countries. [1] Globally, cervical cancer is the fourth most common cancer in women and contributes to morbidity and mortality rates as well as loss of productivity due to disability due to disease. [2]The incidence of cervical cancer is reported to be around 80% in developing countries. [3] Women with cervical cancer in Indonesia reached 17 per 100,000. [4] Most cervical cancer patients have low knowledge about the disease, its symptoms, risk factors, treatment and prevention before diagnosis .[5] The high rate of morbidity and mortality is inseparable from the factor of limited knowledge, lack of awareness and concern for cervical cancer owned by the husband, including the signs and symptoms of the disease experienced by the wife.[6] A study in Jember related to screening behavior in women to prevent cervical cancer, only about 20% of wives received good support from their husbands [7] This limited knowledge and awareness causes delays in the diagnosis and treatment of the disease. So that women are diagnosed at an advanced stage. [8]

Approximately 99% of cervical cancer cases are caused by infection with the human papilloma virus . [9] Human papilloma virus (HPV) types 16 and 18 are closely related factors that cause cervical cancer. [10] Several risk factors for cervical cancer include age at first sexual intercourse, age at first pregnancy, number of sexual partners, number of pregnancies, presence of sexually transmitted diseases (human papilloma virus, herpes, human immunodeficiency virus), low education level, low economic status, exposure to tobacco. [11] lack of appropriate screening and previous treatment of cervical introepithelial neoplasia. [12] A qualitative research found that most of the participants, namely their partners or husbands, were not interested in women's health and did not have much knowledge about cervical cancer including its signs and causes. [13]

Spouses or husbands have a very important role in helping patients to be able to live and overcome various problems that arise in wives who suffer from cervical cancer Research results show that the support provided by husbands to wives can reduce depression and improve quality of life. [14]a result of research conducted on spouses or husbands who were given an intervention in the form of health education about cervical cancer proved that good knowledge after the intervention was able to increase support for wives in early detection of cervical cancer .[15] In contrast to the results of previous research, a study found that although most respondents, namely wives, received low support from their husbands (62%), they still carried out early detection and came to the clinic even without being accompanied by their husbands. Husbands assumed that their wives knew best about their health. so that the husband gives freedom in making decisions. [4] There have been many studies related to women and cervical cancer, but research that explores how husbands or partners know about cervical cancer is still difficult to find. This study aims to explore how the husband's understanding of the signs and symptoms of cervical cancer experienced by his wife. The results of this study can be used as a reference for maternity nursing services, especially nurses who have an important role as educators in an effort to increase knowledge about cervical cancer so that they can raise awareness of partners or husbands to provide support or be able to make the right decisions for the health of their wives.

Methods

This research has passed the ethical study at the Faculty of Nursing, University of Indonesia. This study employs a qualitative method with a phenomenological approach. The descriptive phenomenology method is adopted to explore, analyze, and explain more thoroughly, deeply, and widely the phenomena experienced by the participants (husbands of cervical cancer patients), especially their knowledge of signs and symptoms of cervical cancer suffered by their spouses. [16] The subjects of this study were husbands and cervical cancer patients who received treatment at the Cipto Mangunkusumo Hospital in Jakarta. This research involved husbands of cervical cancer patients who were treated at Cipto Mangunkusumo Hospital. The criteria to participate in this study include: husband and wife who had cervical cancer and had completed treatment, were willing to be respondents by giving informed consent, understood Indonesian language, and can tell their experiences as husbands who had spouses with cervical cancer. Participants in this study were selected by using the purposive sampling technique.[17] Purposive sampling is a technique in non-probability sampling based on the selected subjects' characteristics that comply with the research objectives.[18] 10 participants took part in this study since data saturation had occurred.

This research took place in RSCM Jakarta. RSCM Jakarta was selected since it is the national referral hospital so that the number of cervical cancer cases was relatively high. The study participants were the husbands whose wives suffered from cervical cancer who had finished their treatment at the RSCM and were still regularly checking their health at the same hospital. This qualitative study employed a phenomenological approach. To collect data, the researcher conducted in-depth interviews and semi-structured questions that had been previously made. [19] The process of data analysis in this research followed the steps of Colaizzi namely: after having the interviews, the researcher immediately compiled the results of the interviews into verbatim transcription. To assess the accuracy of the interview results, the researcher listened to the interview recordings again while reading the verbatim transcripts that the researcher had made. In addition, the notes obtained during the interview explaining the nonverbal responses of the research participants were integrated into the transcript. The verbatim transcripts were read multiple times to gain a proper understanding of the results of the interviews. In the next step, the researcher picked out keywords that share the same meaning to be grouped into categories. The same or similar categories are grouped into sub-themes. Furthermore, the researcher grouped the sub-themes into potential themes. [20] Data credibility: the data gained were validated by calling the participants by phone to clarify the results of the interviews. In this study, dependability was performed by conducting an audit inquiry, an audit process carried out by an external reviewer to examine the accuracy of the data and supporting documents during the research process. Confirmability: the researcher did confirmability by systematically collecting the research material and documentation, namely interview transcripts and field notes .[10]

Results and Discussions

This study involved 10 participants. The age of the participants varied between 40-59 years. The level of education also varies from elementary to tertiary education, where there is one primary school education, two junior high schools, six high school seniors and one college student. All participants are Muslim. The length of marriage is between 6-30 years. In this study, the participants involved, namely 10

participants, had almost the same job characteristics, namely the private sector, 1 person as a farmer, 3 people working as employees and 6 people owning their own business.

Husband's Knowledge of Cervical Cancer

Before the wife was declared to have cervical cancer, several things were known and not known by the participants regarding cervical cancer. The participants already understand several things including the signs and symptoms of cervical cancer, medical and alternative treatments for their wives.

Theme 1. Cervical Cancer; Signs and Symptoms

a) Bleeding after Sexual Intercourse

Before knowing that their wives were diagnosed with cervical cancer, almost all participants found signs and symptoms experienced by their wives, namely bleeding after the husband and wife had sexual intercourse. The following is one of their statements.

"……O. The first symptom was at home, when we had sex, why did the blood keep coming out, but if we did not have intercourse, it didn't bleed. It would bleed, after having sex... (P1)."

Supporting the above argument, this participant also said that it bleeds after having sexual intercourse. He thought that it was pre-menstrual bleeding, but it did not look like period blood. He said that:

"...Yes, but menstruation has a regular time, right? but why is it blooding when having sexual intercourse? Whereas there was not a long interval between the intercourses, around one or two weeks, it drips like fresh blood... (P2)."

Similar to what was said by the second participant, some of the other participants also said that there was bleeding after having sexual intercourse with their wives. Participants also thought that when there was bleeding after sexual intercourse, they thought that their wife was going to menstruate. Here are their statements.

"……yes at first it was like that when we had sexual intercourse, my wife bled, I thought she was going to menstruate... (P4)."
"…….When having sex, it sometimes bled.... (P6)."
".....Yes-yes (while nodding head repeatedly) I was also surprised when I had sex with my wife, why the bleeding kept on going,... (P7)."

This participant also said almost the same thing as what the other participants said about bleeding after sexual intercourse. He added that the blood was much. He stated that:

"……after breaking our fast, as we are husband and wife, after making love, she bleeds much……. (P5)."

Bleeding after coitus is also experienced by another participant. He added that his wife's genital was smelly. Here is what he said:

".....Yes, I found the symptom that after having intercourse, the genital bled, and it was smelly, the blood was fresh as like woman giving birth, I was shocked, what happened….? (P9)."

According to the participant who has been married for approximately 20 years, he is afraid to have sexual intercourse because his wife bleeds afterward so that according to him, the participant rarely had sexual relations with his wife. Here is the statement.

".....Yes, sometimes when it's finished, that's why I rarely do it, yes, it's rare..... (P10)."

Cervical cancer is a sexually transmitted disease caused by the Human Papilloma Virus (HPV). This virus consists of many types, but types 16 and 18 have been shown to be very closely related to the cause of cervical cancer .[21] Patients with cervical cancer are usually asymptomatic, especially in the early stages, but at an advanced stage one of the symptoms that can appear is bleeding after sexual intercourse. [22] A study showed that most of the 57.7% of respondents had low knowledge about cervical cancer and 66.7% stated that the symptoms they experienced were bleeding from the vagina.[22] The results also found that almost 90% of respondents did not know the risk factors and signs and symptoms of cervical cancer such as vaginal discharge, bleeding and bleeding after sexual intercourse. [11] The results of this study also found that almost all participants revealed bleeding after sexual contact, but because their knowledge about signs and symptoms of cervical cancer was low, participants did not realize that the bleeding experienced by their wives was one of the signs and symptoms of cervical cancer.

b) A bump on the cervix

Several participants also indicate bumps on the cervix. The bump was shown to the husband when he took his wife to the doctor. In addition, there was also a statement from participants that he felt there was a something different when having sexual intercourse, namely feeling that there was something in his wife's vagina. Here is the statement.

"...I checked again with another obstetrician, we did a pap smear there, I was told to see and there was a white bump as big as a white soybean,..... (P1).
"……But beforehand, I did feel that there was a difference in every intercourse, so it's like there's something in the vagina,…(p2)."
"...But I wasn't told the result, I was told that it looks like a wart on the surface of the uterus... (P5)."
".....Yes, yes, it was said that there is a bump but it's still small,.....(P6)."

Other physical signs and symptoms experienced by their wives were also expressed by participants such as fever. The statement is as follows.

"When this woman worked a bit hard, she always bled a little, but it's clear like normal blood...". (P5).

Signs and symptoms of cervical cancer at an advanced stage in addition to bleeding, an unpleasant odor on the bleeding that comes out there are also lumps or cell dysplasia. [23]A lump in the cervix can be a sign of cervical cancer caused by infection with the human papilloma virus (HPV). To reduce the risk of cervical cancer, it is important for every woman to have regular Pap smears as recommended by doctors as an early detection step for cervical cancer. [24] There are several symptoms to watch out for along with the appearance of a lump in the cervix, including lower abdominal pain, bleeding after sexual intercourse and between menstrual cycles, or abnormal vaginal discharge .[9]

c) Non-post-coital bleeding

Some participants stated that before being diagnosed with cervical cancer, their wives experienced continuous and irregular bleeding. A participant stated that his wife experienced heavy bleeding and the blood came out like blood clots and was finally hospitalized. Here is his statement.

"……..bleeding occurred until my wife fainted, the bleeding was not normal, but what came out was not fresh blood, but frozen blood like plates of blood (while drawing with her hands)… …(P2)."
"...So recently, after a lot of blood had come out like plates, so I just brought her to the doctor... (P4)."
"……the bleeding started in March 2010, a lot of clot blood kept coming out every day..... (P8)."

The oldest participant also revealed that before his wife was declared to have cervical cancer, she also experienced irregular bleeding every month. The bleeding was diagnosed as pre-menopause bleeding, but based on the result of the laboratory test, it turned out that his wife was diagnosed with cervical cancer. Here is the statement in detail.

"...then we thought that the bleeding was due to menopause but it turned out that it wasn't, it was a disease, so when brought to the doctor, my wife was diagnosed with cervical cancer...(P7)."

Supporting the above statement, before the wife's diagnosis was known, the participant said that his wife's bleeding, according to the people in his village, was a sign of menopause, namely, continuous bleeding and irregular menstruation. His statement is as follows.

"……I took her to the Puskesmas (public health center), it was said that she was going to menopause and tired. The bleeding started in March, and (she went) to the Puskesmas for control, it was said that she was about to menopause, the doctor didn't talk about cancer….(P8)."
"…….. Irregular bleeding, her period was like that, people used to say that these women don't want to have children anymore, people here call it "baki", they say they don't want to have more children, they say it's for women. So there are irregular periods, there are 3 or 4 times of menstruation in a month, …… (P10)."

The results of research show that the symptoms of cervical cancer are not always obvious, maybe even the symptoms do not appear at all until the cancer enters the final stage. This is why a pap smear needs to be done to detect abnormal cells and prevent their development into cervical cancer. Spots or abnormal bleeding from the vagina are the most easily recognizable symptoms of cervical cancer .[10] Bleeding usually occurs after sex, outside the menstrual period, or after menopause. abnormal bleeding occurs more than once [6]. In addition to abnormal bleeding, other symptoms that can appear are pain and discomfort during sexual intercourse. Fluid that comes out of the vagina has a strange smell, is of an unusual color or contains blood. [25] In this study, some of the participants stated that with the signs and symptoms experienced by their wives in the form of continuous bleeding outside the menstrual cycle with a large amount of bleeding, the participants took them to a health service center.

d) Vaginal Discharge

Another sign and symptom that was also experienced by the participants' wives were vaginal discharge that came out continuously and had been going on for quite a long time. According to the participants, this condition had been checked by the health service, but the vaginal discharge experienced by the wives was not cured. Here is the statement.

".....my wife said that "dad, I keep having vaginal discharge", she said like that, she then went to the Puskesmas, and took the medicine back, but it was still the same. The vaginal discharge was continuously coming out, non-stop…every day……(P3)."

Another participant revealed that the vaginal discharge experienced by his wife was also with an unpleasant odor. The statement is as follows.

"..... um... I don't remember, then she said why the vaginal discharge smells like this, how come it smells like that after going to the bathroom... (P6)."
"...Actually, the sign was the smell, like a vaginal charge but it was smellier... (P9)."
"... yes, mom had vaginal charge, the strange is the smell..... (P10)."

There are normal and abnormal types of vaginal discharge. Normal vaginal discharge is white or clear, odorless, not much, and only lasts for a few days. This type of vaginal discharge usually occurs before the fertile period and after menstruation. [26] Meanwhile, abnormal vaginal discharge, one of which is caused by cervical cancer, is characterized by vaginal discharge that smells bad, has a certain color, and does not improve. Apart from cervical cancer, abnormal vaginal discharge can also be caused by bacterial or parasitic infections. Vaginal discharge that doesn't go away needs to be checked further.[27] by performing vaginal and cervical examinations, vaginal swab examinations, and cervical cancer screening examinations such as pap smears or IVA (visual acetate inspection). All these tests are carried out to determine whether there is infection and the possibility of cervical cancer.[28] Seperti telah diungkapkan diatas tanda keputihan yang sudah berlangsung lama juga dialami oleh istri partisipan dalam penelitian ini. Keputihan tersebut juga berbau tidak sedap bahkan busuk seperti yang diungkapkan partisipan

Theme 2. Husband's perception towards wife's disease at that time
a) Bleeding was assumed as menstruation

In this research, all participants stated that they did not know about cervical cancer. Some participants assumed that the bleeding after intercourse was from pre-menstruation blood or the effect of birth control. Some participants also did not know that post intercourse bleeding is the sign and symptom of cervical cancer. Here is the statement.

"..... No idea, I thought it was menstruation or the effect of birth control device..... (P1)."

b) No assumption that bleeding was a sign of a disease

When the participant was having sexual intercourse and the wife bled, the participant did not assume and did not know that there was an illness. Here is what the father of four children said.

".....No idea, I didn't know that it was a disease.....(P1)."

Supporting the above statement, this participant also stated that he did not know that when the wife bled after having intercourse was a sign and symptom of cervical cancer.

".....I didn't know, I didn't know at all..... (P2)."
"no, not yet (while shaking head), until she bled a lot, I took her for observation.... (P2)."

c) Feeling that there is something wrong in wife's genitalia
When the wife bled after sexual intercourse, participants felt that there was something going wrong or abnormal and participants started to think that that was an illness. As said by this participant.

".....Yes, I was thinking about that, I thought that something went wrong, but my wife calmed me down, she said that nothing to worry about, she was just going to menstruate..... (P2)."

This oldest participant felt that bleeding after intercourse was abnormal because the wife never had this condition before. Here is his statement.

".....I thought there was an anomaly, it was usually not like that.... (P7).

d) Taking to see a doctor after heavy bleeding
According to one of the participants, after two months of bleeding after sexual intercourse, he and his wife did not have any intention to see a doctor. The wife was asked to see a doctor after she had heavy bleeding. Here is the statement.

".....not yet, not yet (while shaking his head), until there is a lot of blood we went to a doctor for examination.....(P2)."

The results of this study show that all participants do not know about cervical cancer and how the signs and symptoms are. This low level of knowledge is one of the factors causing delays in the treatment of cervical cancer experienced by the participants' wives. Delay in diagnosis causes high morbidity and mortality rates at the world level. Early detection with pap smears is one of the prevention efforts that can be done, but the limited knowledge of women and their partners about pap smears is one of the factors that cause high morbidity rates . [29] A study found that participants' knowledge about cervical cancer was low and some misconceptions are among the participants. In fact, many participantsin different FGDs consistently stated that cervical cancer is due to the use of contraceptives, side effects of using contraceptives [30].

Theme 3. Husband's knowledge after wife suffered from cervical cancer
a) Media
Almost all participants stated that they had never known about cervical cancer from newspapers, TV, or counseling from their workplaces or where they stay. Here is the statement.

"I don't know yet, now there's a lot (of information) on TV, at that time I didn't know, (while shaking head repeatedly) ... (P7)."
".... I rarely (find that information), rarely (find that information) from newspapers.... (P10)

"…….. Haven't (found information) on TV yet, I've never read a newspaper, I didn't know it, only now, after my wife was taking this treatment. There was someone with herbal medicine who wanted to give counseling but couldn't meet me because I was still working. So he didn't meet me, he said that someone wanted someone to come to my house but after several months he didn't come... (P5)."

b) Health instructor

The participants said that health instructors never informed them about cervical cancer, they had never visited their houses so that participants did not know about cervical cancer. The following is the statement from a participant, a father of 4 children.

"……Not yet, if they had come, (my wife will) definitely be checked, health instructors might not reach the community, right, so I don't know……(P1)."

The results of this study found that some participants did not know about cervical cancer either through TV media, newspapers or exposed to health education conducted by health workers. The level of knowledge greatly affects a person's attitude and behavior. A research result found that only 19.2% of women knew about early detection and doing a Pap smear.[31] This phenomenon shows that information related to cervical cancer is important to be well socialized to the community.

Theme 4. Cervical cancer needs treatment

a) Medical treatment

Participants in this study stated that the medical treatment taken was radiotherapy, namely external and internal radiation, and chemotherapy. There was one participant who stated that his wife's treatment before external radiation was surgery. The following is the detailed statement.

Participants who have 4 daughters said that after their wife was diagnosed with cervical cancer, the best treatment for her according to the doctor was surgery. The statement is as follows.

"……Then the doctor said that it could (be cured), the only way to prevent it from spreading to other places was to have surgery….. (P1)."

After surgery, like the other participants, all of their wives received medical treatment related to cervical cancer experienced by their wives. Here is a detailed explanation.

"...Alhamdulillah, did not use internal radiation, but after surgery, it was radiated, one operation, 25 times of external radiation... (P1)."
"……So it was 25 times of the outer radiation, 5 times of the chemo, 3 times of the inner radiation… (P2)."
"Since July 2010, 25 times of external radiation, 3 times inner radiation, and at NIMO for up to 2 years.... (P3)."
"...29 external irradiation, 3 times internal irradiation, 3 times chemotherapy,……(P4)."
"...Get 24 times external light, 3 times inner light and 3 times chemo... (P5)."
"...so it was said that 25 times the outer radiation, 5 times the chemotherapy and 3 times the inner radiation.... (P6)."
"……The treatment included 25 times external radiation, 3 times inner radiation, and 5 times chemo (P7)."

"..... more than 30 times external radiation, 8 times internal radiation, it's up to 2 times in one year. But before that, it took more than 50 bottles, now it's 2 times a month, now it's finished.... (P9).
"....., 25 times outer radiation, 3 times inner radiation, 3 times chemo...(P10)."

The results of this study found that all of the participants' wives were given cancer treatment, either in the form of chemotherapy, radiation and surgery. How to treat cervical cancer is determined by several factors. Some of them, cervical cancer treatment is carried out based on the stage of cancer or other health problems that may be the cause of cervical cancer .[32] There are several ways you can do to treat cervical cancer, such as surgery, radiotherapy, chemotherapy, targeted therapy, and immunotherapy .[33]

b) Alternative treatment
According to the participants' statements, after their wife was diagnosed with cervical cancer and had undergone treatment at the RSCM, several participants stated that they were also trying to bring their wives to alternative treatment. Here is his statement.

".....when I went to Cipto, there was no treatment there, that means no medicine was given, I also took alternative medicine, it was given to what seemed like its roots (while looking at his wife). ...(P4)."
".....yes before going to Budiasih, we called an alternative treatment practitioner to our house, he did massage and gave some herbs such as white turmeric.... (P8)."
Like other participants above, this one participant also used herbal medicine to increase his wife's immune system. Here's his statement.
"...Ant nest plants from Papua too, I got her drink it....(P9)

A research shows the use of herbal therapy as an alternative to cervical cancer treatment by giving white turmeric and Mutiara grass giving this herbal medicine proven to be able to improve the quality of life of cancer patients. [34] The results of a study found curcuminoids of ginger to be an alternative treatment for cervical cancer because ginger from various studies can inhibit the growth of cancer cells. Some research results show that turmeric can kill cancer cells and may also treat stroke and dementia. Alternative treatment using curcumin is also being developed in a hospital in England for cancer patients in addition to chemotherapy .[35] Ant nests have long been used by the people of the interior of Papua to treat various diseases, both mild and severe. The use of ant nests as herbal medicine has been the secret of a very powerful treatment and has been carried out for generations in the interior of Papua. Some of the properties of ant nests are proven to be able to help treat various types of tumors and cancers such as: brain cancer, breast cancer, nose cancer, liver cancer, lung cancer, colon cancer, uterine cancer, skin cancer, prostate cancer and leukemia[36]. Ant nests contain flavonoids, tannins, and polyphenols that function as antioxidants. Polyphenol active compounds besides having a function as an antioxidant, this substance also has many properties such as antimicrobial, antidiabetic, and anticancer. [37]

Conclusion

The phenomenon of the experience of a husband who has a wife with cervical cancer provides a different experience for each husband. In this study it was found that all participants had very limited knowledge about cervical cancer, this of course could encourage nursing institutions to develop and function the tridharma of higher

education, one of which is community service. Where this community service is carried out by providing health education about cervical cancer, so that people have good knowledge about cervical cancer.

Declaration Section

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The relationship of exclusive breastfeeding and local food complementary feeding with stunting in infants 6-12 months

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Abstract

Stunting is an irreversible nutritional problem in children and it is the effect of nutritional deficiencies in the long term. Decreased cognitive function and physical abilities, and increased the risk of degenerative disease are effects of stunting. This study aimed to analyze the relationship between exclusive breastfeeding and local food complementary feeding with stunting in infants 6-12 months. This was an observational study with a cross-sectional design. The study was carried out at the Singotrunan Community Health Center, Banyuwangi from July to August 2021. A total of 171 children aged 6-12 months were included this study by selected simple random sampling. The dependent variable was stunting. The independent variables were exclusive breastfeeding and local food complementary feeding. The data collected were done using questionnaires and body length measurements, then analyzed with Gamma correlation test on IBM SPSS. Stunting was directly and positively affected by exclusive breastfeeding (p value <0.001 with a correlation strength of 0.641) and local food complementary feeding (p value <0.001 with a correlation strength of 0.705). In conclusion, stunting was directly and positively by exclusive breastfeeding and local food complementary feeding. Infants were exclusively breastfed; they will have normal nutritional status and the risk of stunting was decreased. Increasing intake by local food complementary feeding can avoid the risk of stunting.

Keywords: exclusive breastfeeding, local food complementary feeding, stunting

Background

Toddlers are an age group that is vulnerable to nutritional problems.[1] Inadequate nutritional needs in the first thousand days of life have irreversible long-term effects.[2–4] One of them is stunting. Besides being caused by inadequate nutrition, stunting also occurred because repeated infections in children. The long-term effects of stunted children are decreased cognitive and physical development, as well as an increased risk of degenerative diseases. Stunting in children is one of the most significant developmental barriers in humans and is a marker of risk for poor child development. Children can be said to be stunted if the results of measuring nutritional status based on body length according to age are less than two standard deviations below the median value of child growth.[5]

Indonesia ranks fifth for stunting toddlers.[6] Globally, WHO is targeting a 40% reduction in stunting under five by 2025.[5] The prevalence of stunted and severely stunted in Indonesia based on the Riskesdas 2018 is 30.8%, a decrease compared to 2013 which was 37.2%. This has not yet reached the 2019 RPJMN target of 28%.[7] UNICEF 2006 reported the causes of malnutrition in children under five, namely inadequate diet, poor breastfeeding practices, inappropriate introduction of complementary foods, limited quality, quantity and variety of complementary feeding, and inadequate protein needs.[5,8] The government's effort in tackling the improvement of nutrition in children is the 1000 HPK movement. The indicators used in this effort are exclusive breastfeeding, complementary feeding, improvement of nutritional status (reduction of stunting (40%) and wasting (<5%).[3] WHO recommends the use of local food complementary feeding to improving nutritional status. Local food recommendations to ensure food availability and access to food will meet affordable children's nutritional and energy needs.[9]

Exclusive breastfeeding is breast milk that is given to infants from birth until they are six months old, without adding other foods or drinks.[10,11] The prevalence of exclusive breastfeeding globally is 40%.[12] The prevalence of exclusive breastfeeding in Indonesia based on Riskesdas 2018 is 37.3%, an increase compared to 2013 which was 30.2%.[7] In WHO recommendations, exclusive breastfeeding is given for 6 months from birth and continued until the age of two years or more, because the nutritional content in breast milk can meet the nutritional needs of infants. The substances contained in breast milk include fat, protein, carbohydrates, iron, vitamins, electrolytes, and minerals.[13] Infants who consume enough breast milk will have their nutritional needs met, so they can avoid the risk of malnutrition.[14] Research shows that exclusive breastfeeding is associated with nutritional status.[15–19] Exclusive breastfeeding reduces the risk of nutritional problems in infants such as stunting.[20] Lestari *et al*.'s research revealed that exclusive breastfeeding was able to reduce the prevalence of stunting in children under five years old.[6]

With age, the infant's needs are increasing, therefore, infants need complementary foods when they are six months old. Complementary feeding is needed because the nutrients contained in breast milk are not sufficient for daily nutritional needs. When infants are 6-9 months old, breast milk can only meet 67% of their nutritional needs and only 50% of their needs when infants are 9-12 months old.[21] Complementary foods must be given appropriately, such as the form, frequency of administration, and the type of complementary foods. WHO recommends the provision of local food-based complementary feeding in improving children's nutritional status.[9] Therefore, this study aims to analyze the relationship between

exclusive breastfeeding and local complementary foods with stunting in infants 6-12 months.

Methods

This was observational study with a cross-sectional design from July to August 2021 to analyzed the relationship between exclusive breastfeeding and local food complementary feeding with stunting in infants 6-12 months. Infants 6-12 months were including this study at Singotrunan Community Health Center, which consisted of seven villages. Assessment of nutritional status based on body length index according to age. A total of one hundred and seventy-one infants were included in this study with the criteria of having KMS, the infant's mother could read and wrote, and was willing to be the subject of the study and be interviewed. Consent to be a research subject is evidenced by a signature on the informed consent. Toddlers with a history of low birth weight and empty immunization status were excluded from the study.

The study was conducted using a sampling technique based on probability sampling, namely simple random sampling. Data on exclusive breastfeeding and local food complementary feeding were taken using a questionnaire. Nutritional status data were taken by direct measurement using an Infantometer with an accuracy of 0.1 cm, measured three times and the average calculated.

The independent variables in this study were exclusive breastfeeding and local food complementary feeding. The dependent variable of this research is stunting nutritional status. A gamma correlation test was performed for bivariate analysis using IBM SPSS 24 software, with a significance value of $p<0.05$. This research has been approved by the Ethics Committee of the Faculty of Medical Ethics, Sebelas Maret University with the number 59/UN27.06.6.1/KEP/EC/2021.

Results and Discussions

The subjects were 171 infants aged 6-12 months in Banyuwangi, East Java. Table 1 shows that the highest age who participated in this study were infants of 8 months (18.7%) and the lowest was 12 months of infants (7.6%). From 171 research subjects, as many as 91 infants (53.2%) were male, 113 infants (66.1%) were exclusively breastfed, and 115 infants (67.3%) received local food solids in a good category. The age of the mothers who participated in this study were between 21-25 years as many as 54 (31.6%) and at least they were more than 35 years old, namely 17 (9.9%). The number of parents with medium and high incomes is the same, namely 66 (38.6%), parents with low incomes as many as 39 (22.8%). Mothers with the most recent high school education participated in this study, namely 75 (43.9%) and the least mothers with elementary school education were 25 (14.6%).

Table 2 shows the results of bivariate analysis of exclusive breastfeeding with stunting. Most of the infants who were exclusively breastfed had normal nutritional status, namely 96 infants (91.4%), 7 infants (46.7%) were height, and only 10 infants (19.6%) were stunted. Most of the infants who were not given exclusive breastfeeding were stunted, namely 41 (80.4%), 9 infants (8.6%) with normal nutritional status, and 8 infants (53.3%) high. From the results of the gamma correlation test using SPSS, a p value of <0.001 was obtained with a statistically

strong correlation strength (0.641). This means that there is a significant relationship between exclusive breastfeeding and stunting.

Table 3 shows the results of the bivariate analysis of local food complementary feeding with stunting. Some of the infants who were given good complementary foods had normal nutritional status, namely 92 (87.6%), 10 infants (66.7%) were height, and only 13 infants (25.5%) were stunted. Most of the infants who were given poor complementary foods were stunted, namely 38 (74.5%), only 13 infants (12.4%) were normal, and 5 infants (33.3%) were height. From the results of the gamma correlation test using SPPS, a p value of <0.001 was obtained with a statistically strong correlation strength (0.705). This means that there is a significant relationship between local food complementary feeding and stunting.

The results showed that stunting directly and positively affected by exclusive breastfeeding. Exclusive breastfeeding that is less than optimal is one of the factors causing stunting, especially non-exclusive breastfeeding.[5] Exclusive breastfeeding is the best food for infants because it contains the nutrients needed so that it can meet the infant's needs for the first six months without complementary foods.[14] Breast milk contains important nutrients needed for growth and development, as well as antibody substances that can protect infants from infections that cause nutritional depletion, so they can avoid stunting.[5,13] In this study, most of the mothers gave colostrum to their infants, which is a very thick yellow thick liquid produced since the sixteenth week of pregnancy and contains antibodies and anti-infective substances such as immunoglobulin A, lysosomes, lactoferrin, and white blood cells in high concentrations.[13] Giving colostrum to infants is known through the answers to the questionnaire given. The results of research by Lestari *et al*. stated that breastfeeding can reduce the risk of stunting 0.23 times better than those who do not receive exclusive breastfeeding.[6] This is also supported by the research of Anindya *et al*. that exclusive breastfeeding reduces the risk of nutritional problems in infants such as stunting.[20] Other studies also support the results of this study that there is a significant relationship between exclusive breastfeeding and nutritional status.[15–19]

The results of the study also showed that stunting directly and positively affected by local food complementary feeding. Stunting is a risk marker for poor children development. Complementary feeding is defined as a feeding process that begins when breast milk alone is no longer sufficient to meet the infant's nutritional needs. The Local food complementary feeding with limited quality, quantity, and variety is one of the factors causing stunting. Dietary diversity and consumption of animal food sources are associated with increased linear growth.[5] WHO recommends the local food-based complementary feeding to improve the nutritional status of children, because to ensure food availability and access to affordable food.[9] In this study, infants were given complementary food to local food, namely fish, where the city of the study area is the largest fish-producing port in Indonesia. Hendriyani *et al*. states that locally available food has the potential to improve the quality of infant food by increasing the frequency of its consumption.[22] Stunting is influenced by giving complementary feeding that are too early or less than 6 months old, this increases the risk of allergies and causes infants to experience digestive disorders such as diarrhea and if handling is not good it can cause stunting in children.[23,24] This is in line with the research of Uwiringiyimana *et al*. that the appropriate complementary feeding reduces the incidence of stunting.[25] Local food-based complementary feeding can increase intake[26–28] and meet the nutritional needs of

children in the first thousand days of life.[28] Local food-based complementary feeding that are combined can increase nutritional adequacy but cannot meet daily nutritional needs.[29] A study conducted by Ahmed *et al*. revealed that fast food based on local food can increase body weight and reduce the risk of child malnutrition.[30] Complementary feeding given with exclusive breastfeeding can reduce the risk of malnutrition problems in toddlers.[31]

Conclusion

Stunting was directly and positively by exclusive breastfeeding and local food complementary feeding. Infants were exclusively breastfed; they will have good nutritional status and the risk of stunting was decreased. Increasing intake by local food complementary feeding can avoid the risk of stunting.

Declaration Section

The authors thank all mothers who were willing to participate in the study and agreed to have their children be the subjects of this study. Thank you to the local Health Office and Singotrunan Community Health Centre for giving permission to conduct research in their working areas. Thank you to all postgraduate nutrition lecturers at Sebelas Maret University, especially the supervising lecturers who have helped in writing this rich scientific paper.

Ethical Approval

Ethical clearance has been approved by the research ethics commission of the Faculty of Medicine, Universitas Sebelas Maret under number 59/UN27.06.6.1/KEP/EC/2021.

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Tabel 1. Characteristic of respondent

Characteristics	N	%
Infant's age group		
6 months	31	18.1
7 months	24	14
8 months	32	18.7
9 months	23	13.5
10 months	25	14.6
11 months	23	13.5
12 months	13	7.6
Sex		
Boy	91	53.2
Girls	80	46.8
Exclusive Breast feeding		
Yes	113	66.1
No	58	33.9
Complementary Feeding Local Food Based		
Good	115	67.3
Not Good	56	32.7
Mother's age group		
<21 years	32	18.7
21-25 years	54	31.6
26-30 years	40	23.4
30-35 years	28	16.4
>35 years	17	9.9
Parent's income		
<Rp.1.000.000	39	22.8
Rp.1.000.000-Rp. 2.314.718	66	38.6
>Rp.2.314.718	66	38.6
Mother's last education		
Primary school	25	14.6
Junior high school	30	17.5
Senior high school	75	43.9
Bachelor/diploma/Master	41	24

Table 2. Bivariate analysis statistic exclusive breastfeeding with stunting

Exclusive Breastfeeding	Nutritional Status			r	p value
	Stunting	Normal	High		
Yes	10	96	7	0.641	<0.001
	19.6%	91.4%	46.7%		
No	41	9	8		
	80.4%	8.6%	53.3%		

Table 3. Bivariate analysis statistic complementary feeding local food based with stunting

Complementary Feeding Local Food Based	Nutritional Status			r	p value
	Stunting	Normal	High		
Good	13	92	10	0.705	<0.001
	25.5%	87.6%	66.7%		
Not Good	38	13	5		
	74.5%	12.4%	33.3%		

Overview of blood pressure and factors affect in the elderly with hypertension

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Abstract

Hypertension is a chronic disease with a high prevalence in the elderly. Hypertension is a risk factor for cardiovascular disease that causes death but can be prevented. The study aimed to determine blood pressure based on the factors that affected the elderly with hypertension. This study uses a descriptive design with a quantitative approach. The population was elderly with hypertension in the Outpatient Unit of the Islamic Hospital Nashrul Ummah Lamongan in February-April 2019. The sample is 64 elderly with hypertension used a consecutive sampling. The instrument of research uses a calibrated digital sphygmomanometer, weight scales, meters scales, and questionnaires to measure the characteristics and factors that influence hypertension. The analyzed data using descriptive statistics. The results were 53.1% female, the mean systolic was 165 mmHg, and diastolic was 101 mmHg. There is an equal distribution of the age of 60-74 years and age of 75-90 years as 46.9%, the mean systolic is 169.33 mmHg, and diastolic is 103.17 mmHg. Family of hypertension history 71.9%, mean systolic 167.59 mmHg and mean diastolic 103.46 mmHg. Almost all the patients are not obese 90.6%, thin BMI average systolic 170.50 mmHg and diastolic 101.18 mmHg, normal BMI systolic average 165.24 mmHg and diastolic average 101.63 mmHg. A total of 96.9% consumed salty foods, the mean systolic 166.53 mmHg, and diastolic average 101.47 mmHg. A total of 71.9% did not smoke, the mean systolic 170.11 mmHg, and mean diastolic 102.70 mmHg. A total of 68.7% had a habit of physical activity, the mean systolic was 165.60 mmHg, and the diastolic average was 101.59 mmHg. The study concludes means systolic 166.56 mmHg and means diastolic 101.45 mmHg, the high prevalence of hypertension occurred in the family history of hypertension.

Keywords: blood pressure, hypertension, elderly

Background

The increase in life expectancy has an impact on increasing the proportion of the elderly population. Data from the population census shows that in 2023 the elderly in Indonesia 7% of the total population, with a ratio of more than 10% experiencing dependence.[1] This became a problem and challenge with the increasing prevalence of degenerative diseases: hypertension, diabetes mellitus, and psychological disorder. Increasing age causes aortic wall elasticity to decrease is caused by cardiovascular disease, in which one's hypertension causes many premature deaths.[2] Hypertension is a cause of premature death in the world, and many as 9.4 million people die from complications of hypertension.[3,4]

Hypertension is an increase in systolic blood pressure of more than 140 mmHg and diastolic more than 90 mmHg, based on the results of two or more measurements.[5] Hypertension can be caused by two factors, namely factors that cannot be changed and factors that can be changed. Factors that cannot be changed are family medical history, age, gender, genetics, and ethnicity. Modifiable factors are obesity, consumed salt, smoke habits, exercise habits, consumption of fatty, caffeine, alcohol, and stress.[6]

The prevalence of hypertension tends to increase. The national prevalence of hypertension as measured by age 18 years was 25.8% in 2013 and experienced a significant increase in 2018 by 34.1%. The prevalence of hypertension also increases with increasing age, namely in 2013 at the age of 55-64 years 45.9% increased in 2018 to 55.2%, at the age of 65-74 years from 57.6% increased to 63.2% and at the age above 75 years from 63.8% to 69.5%. East Java Province is one of the areas that has a prevalence of hypertension above the national average prevalence, which is 26.2% in 2013 and increased in 2018 to 36.3%.[7,8] The high prevalence of hypertension nationally, in East Java and Lamongan Regency, needs attention so that the number does not continue to increase. A preliminary study conducted by researchers at the Outpatient Unit of the Islamic Hospital Nashrul Ummah Lamongan found that most of the hypertension patients occurred in the elderly. The results of interviews with 8 elderly with hypertension, known they smoke habits, are overweight and have a family history of hypertension.

The results of the study showed that the death of patients with heart disease had a history of hypertension. Every 20/10 mmHg increase in systolic/diastolic pressure, will increase by 20% the risk of death from heart disease.[9] The increasing prevalence of hypertension required treatments to reduced. One of the efforts is to identify the factors affecting hypertension so which is expected to minimize hypertension and provide effective action. Identification of factors can be analyzing the characteristics of the causes of hypertension. Efforts to control blood pressure in patients with hypertension can be carried out through primary and secondary prevention strategies to prevent complications of hypertension.[10] Studies on factors that influence hypertension in previous studies have been carried out on patients with hypertension in general, it is necessary to conduct special research on factors that affect the elderly with hypertension, because of the differences in characteristics, namely the blood pressure of the elderly which is always changing and unpredictable, so that The elderly are at risk of falling easily so it is very dangerous for the elderly.

Methods

The research is quantitative with a descriptive approach. The study aimed to determine blood pressure based on the factors that affected the elderly with hypertension. The research variable measured of blood pressure of the elderly with hypertension. The population's studies are elderly with hypertension at the Outpatient Unit of the Islamic Hospital Nashrul Ummah Lamongan in February-April 2019. The sampling technique used consecutive sampling. The research sample was 64 elderly with hypertension, which were measured by blood pressure, BMI, and research questionnaire.
The instruments used a digital sphygmomanometer, weight scale, and meter scale to can knew BMI. Questionnaires to measure the demographic characteristics that affect factors of hypertension: age, genders, family history, obesities, consumed salt, smoke habits, and exercise habits.

Primary data collection using a questionnaire using interviews, directly measuring the patient's blood pressure, weights, and heights. For direct measurements, researchers were assisted by several enumerators who had conducted perception tests with researchers, so that the measurement results produced the same data between researchers and enumerators. Secondary data based on the history of hypertensive patients from medical records. Analyzed data used descriptive statistics to identify demographics and characteristics of research variables in frequency distributions and percentages of blood pressure and factors that affect the elderly.. This research obtained information on ethical suitability from the Faculty of Nursing Universitas Airlangga, Number of Ethical Approval 1667-KEPK.

Results and Discussions

The results (Table 1) show most patients' females 53.1%, the elderly and the old was 46.9%. The results of data analysis showed that the proportion of family history of hypertension was 71.9%, and 90.6%, not obesity. Not smoking 71.9%, not consuming salt 96.9%, and having a habit of doing physical activity 68.7%.

The results (Table 2) showed that the lowest systolic pressure was 140 mmHg, and the highest systolic pressure was 213 mmHg. The low diastolic pressure was 90 mmHg, and the high diastolic pressure was 121 mmHg. The highest standard deviation was 19.54 mmHg, and the highest variance was 381.89 mmHg.

Blood pressure based on family history
Family history data (Table 3) showed that 71.9% had a family history of hypertension, and 28.1% had no history of hypertension. These results indicate that the proportion of hypertension is higher in patients who have a family history of hypertension. The results showed that the mean systolic was 167.59 mmHg and the mean diastolic was 103.46 mmHg, the maximum standard deviation was 21.59 mmHg, and the maximum variance was 466.28 mmHg in patients with a family history of hypertension.

The results showed that genetic factors had a greater risk of suffering from hypertension. This is associated with increased intracellular sodium and potassium-to-sodium ratio so that nearly 70-80% of patients have a family history of

hypertension. Having a history of hypertension in both parents has a greater tendency to suffer from essential hypertension.[11] The results of other studies indicate a relationship between a family history of hypertension and the occurrence of hypertension. The prevalence of high hypertension affects the family history of hypertension, genetic factors caused by renin cell membrane metabolism.[12]

Blood pressure based on age factors

The results studies (table 2) most of the respondents were in the elderly and old group respectively 46.9%. The elderly group had a mean systolic of 169.33 mmHg and a mean diastolic of 103.17 mmHg. While the old group had a mean systolic of 166.69 mmHg and a mean diastolic of 101.23 mmHg with a maximum standard deviation of 19.60 mmHg and a maximum variance of 384.24 mmHg. Age over 60 years tends to be more susceptible to primary hypertension because of the decreased elasticity of the aortic wall. A person is susceptible to primary hypertension at the aged of 60 years, and 50-60% of patients have a mean systolic of 140 mmHg and a mean diastolic of 90 mmHg. Hypertension occurs due to the decreased elasticity of the aortic wall causes hypertension.[6]

The results showed the proportion of hypertension was more in the elderly group, so will conclude no relations between increased age and blood pressure. Another factor that affects blood pressure is consumed food.[13] Another study found that was a relation between consumed sodium, magnesium, and magnesium with blood pressure in the elderly. Excessive sodium intake caused sodium in the extracellular fluid to increase (Cahyahati, Kartini, & Rahfiludin, 2018). The increased extracellular fluid volume causes blood volume to increase so that the heart pump also increases and causes blood pressure to increase.[14]

Blood pressure based on gender factors

The results studies (Table 3), as many as 53.1% of female respondents, while 46.9% of male respondents. The data indicated prevalences of hypertension in females are high than in males, with a mean systolic of 165 mmHg and a mean diastolic of 101 mmHg with a maximum standard deviation of 19,216 mmHg and a maximum variance of 369.23 mmHg.

The Third National Health and Nutrition Examination Survey (NHANES) III, the prevalence of hypertension in males is higher than in females who have not experienced menopause. Post-menopause or enter the aged of 60 years, the prevalence of hypertension in both males and females is almost the same. When females experience regular menstrual bleeding will reduce the intravascular volume. Increasing age causes the incidence of hypertension in females to be higher than in males.[15]

Menopause will increase the risk of hypertension in females. Females postmenopause protect estrogen hormone, which will increase levels of High-Density Lipoprotein. The lowest HDL levels and highest levels of Low-Density Lipoprotein will the affecting atherosclerosis process.[16,17] Other studies also mention the prevalence of hypertension is higher in females who experience menopause. During menopause, there are changes in the hormone's estrogen and androgen as a cause of increased renin release.[18]

Bood pressure based on obesity factors

The results studies (Table 3) as many as 9.4% of respondents were obese, and 90.6% of the respondent not obese. The results show non-obese patients, thin BMI,

and a normal BMI had a higher prevalence of hypertension. Patients with a thin BMI had a mean systolic of 170.50 mmHg and a mean diastolic of 101.18 mmHg. Respondents with normal BMI had a systolic mean of 165.24 mmHg and a diastolic mean of 101.63 mmHg. Several previous studies have stated that obesity is associated with increased blood pressure in both males and females.[19,20] The results of other studies also state that obesity will increase the risk of hypertension.[21]

The low proportion of obesity is probably due to the respondent being more than 60 years old, so that the eating pattern at that age tends to decrease. However, this study is also in accordance with several other studies which show that there is no relationship between obesity and increased blood pressure.[22] This is based on the opinions of experts' pathogenesis, and the mechanism of obesity with the incidence of hypertension still cannot be explained in detail. The opinion of several experts states that genetic factors play a role in the occurrence of hypertension in obesity, but there are experts who argue that it is environmental factors that are very influential.[23]

Blood pressure based on smoke habits

The results studies (Table 3) showed 28.1% smokers and 71.9% non-smokers. The proportion of hypertension is high in patients who do not have a smoking habit with a mean systolic of 170.11 mmHg and a mean diastolic of 102.70 mmHg, standard deviation of 17.62 mmHg, and variance of 310.33 mmHg.

Habits and easy access to cigarettes make it easier for the elderly to get cigarettes without the knowledge of their families. The low knowledge of the elderly about the affect factors of hypertension is the cause elderly living an unhealthy lifestyle. Several research results state that the prevalence of hypertension is closely related to lifestyle.[24] However, observations results of person do not initially suffer hypertension, but after 9.8 years they were a significant increase in blood pressure due smoke cigarettes per day more than 15. Nicotine is caused by increased heart rate and peripheral vasoconstriction, increases arterial blood pressure during and after smoking.[25]

Several studies state that smoking is not associated with the incidence of hypertension in the elderly.[11,26] Nicotine and carbon dioxide in cigarettes can damage the endothelial of the artery and decrease the elasticity of blood vessels and causes an increase in blood pressure.[27]

Blood pressure based on consumption of salty food

The results (Table 3) show the respondents do not consume salty foods 96.9%. Respondents had a mean systolic of 166.53 mmHg and a mean diastolic of 101.47 mmHg with a standard deviation of 19.86 mmHg and a variance value of 394.59 mmHg. Salt important factor role in hypertension. Consumption of three grams of salt per day can lower the prevalence of hypertension, salt intake of 5-15 grams per day causes a higher of 15-20% in the prevalence of hypertension. The effect of salt consumption on the occurrence of hypertension is the mechanism of volumed plasma, cardiac output, and blood pressure increases.[28] A vasopressor mechanism will be active due to salt consumption, increasing water retention cause increased blood pressure.[29]

In studies a gap between theory and research results. Almost all respondents who do not consume salt food had hypertension, causing other factors. Several studies

have stated that the incidence of hypertension is not related to the consumption of salty foods, fatty foods, flavorful foods, eating vegetables, and eating fruit.[30]

Blood pressure based on habits of exercise habits/ physical activity

The results showed that 68.7% of respondents exercised and 31.3% did not exercise, the standard deviation 20.33 mmHg, and variance 413.33 mmHg. The prevalence of hypertension is high in respondents had did not exercise habits with a mean systolic 165.60 mmHg and a mean diastolic 101.59 mmHg. Regular exercise will increase oxygen consumption by 40-60% if approximately 30 minutes, two to three times a week can lower blood pressure.[31]

Physical activity will increase blood pressure if do a regular physical activity you can be healthy and had stable blood pressure. Some studies recommend getting 30-60 minutes of moderate-intensity physical activity 5 days a week and 20 minutes of vigorous-intensity physical activity 3 times a week. Blood pressure will decrease by 20-10 mmHg with regular physical activity.[32] Other studies state the relations of physical activity with the incidence of hypertension. In patients with hypertension and heart disease, find person less activity with a risk of 30-50%.[33] This result also strengthens that a person will be at a 2,899 times higher risk of suffering from hypertension if he does not do regular physical activity.[34]

Conclusion

The concluded study is the mean systolic blood pressure of the elderly is 166.56 mmHg, and the mean diastolic is 101.45 mmHg. Affecting factors blood pressure is 71.9% family history of hypertension, female 53.1% and old category 46.9%, obesity 84.5%, not consumed salt food 96.9%, not had smoke habit 71.9% and had physical activity habits. Systolic pressure maximum 213 mmHg, diastolic pressure maximum 121 mmHg, obtained in patients with a history of hypertension family, old category, males, normal BMI, not smoke habits, not consumed salty foods, and having a habit of physical activity.

Conflict of Interest

The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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Table 1. Characteristics demography of elderly with hypertension (n=64)

Characterictic	Frequency	Percentage (%)
Gender		
Male	30	46.9
Female	34	53.1
Age		
60-74 year (elderly)	30	46.9
75-90 year (old)	30	46.9
> 90 year (very old)	4	6.2
Family History		
Yes	46	71.9
No	18	28.1
Obesity		
Yes	6	9.4
No	58	90.6
Smoking Habits		
Yes	18	28.1
No	46	71.9
Salty Foods Consumption		
Yes	2	3.1
No	62	96.9
Exercise Habits		
Yes	44	68.7
No	20	31.3
Total	32	100

Table 2. Descriptive analysis of blood pressure in the elderly with hypertension (n=64)

Blood Pressure	N	Range	Min.	Max.	Mean	Standar Deviation	Variance
Sistole	64	73	140	213	166.56	19.54	381.89
Diastole	64	31	90	121	101.45	9.59	92.07
Valid N (listwise)	64						

Table 3. Descriptive analysis of blood pressure based on affecting factors blood pressure in elderly with hypertension (n=64)

Variable		N	Range	Min.	Max.	Mean	Standar Deviation	Variance
Family History of hypertension	Yes							
	Systolic	46	73	140	213	167.68	21.59	466.28
	Diastolic	46	31	90	121	103.46	10.32	106.54
	No							
	Systolic	18	32	148	181	163.68	13.59	184.57
	Diastolic	18	11	90	101	96.31	4.74	22.48
Age	Elderly							
	Systolic	30	61	140	201	169.33	19.60	384.24
	Diastolic	30	31	90	121	103.17	10.05	101.06
	Old							
	Systolic	30	70	143	213	166.69	19.57	382.81
	Diastolic	30	31	90	121	101.23	9.01	81.17
	Very Old							
	Systolic	4	8	141	149	144.75	5.73	32.81
	Diastolic	4	0	90	90	90.10	0.14	0.02
Gender	Male							
	Systolic	30	73	140	213	167.33	19.22	369.24
	Diastolic	30	31	90	121	101.33	9.62	92.53
	Female							
	Systolic	34	60	140	200	165.00	20.43	417.25
	Diastolic	34	30	90	120	101.00	9.92	98.38
Body Mass Index (BMI)	Thin							
	Systolic	10	52	148	200	170.50	20.23	409.26
	Diastolic	10	22	90	113	101.18	8.31	69.08
	Normal							
	Systolic	48	73	140	213	165.24	20.72	429.21
	Diastolic	48	31	90	121	101.63	10.58	111.87
	Obese							
	Systolic	6	17	164	181	170.53	9.02	81.32
	Diastolic	6	1	100	101	100.40	0.36	0.13
Smoking Habits	Yes							
	Systolic	18	61	140	201	157.48	17.62	310.33
	Diastolic	18	31	90	121	98.26	9.55	91.29
	No							
	Systolic	46	73	140	213	170.11	19.45	378.36
	Diastolic	46	31	90	121	102.70	9.53	90.74
Salty Foods Comsumption	Yes							
	Systolic	2	0	167	167	167.40		
	Diastolic	2	0	101	101	100.70		
	No							
	Systolic	62	73	140	213	166.53	19.86	394.59
	Diastolic	62	31	90	121	101.47	9.75	95.11

Variable		N	Range	Min.	Max.	Mean	Standar Deviation	Variance
Exercise Habits	Yes							
	Systolic	44	73	140	213	165.60	20.33	413.33
	Diastolic	44	31	90	121	101.59	9.98	99.68
	No							
	Systolic	20	61	140	201	168.65	18.54	343.86
	Diastolic	20	31	90	121	100.59	9.22	84.99

Breastfeeding nursing care is not effective for post cesarean section mothers: a case report

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Abstract

Barriers to breastfeeding are experienced by many postcesarean section mothers which cause the breastfeeding process to be ineffective. So that the baby's nutritional needs are not adequate. Aims: Aim of this study is to determine the nursing process of increasing ineffective breastfeeding in postcesarean section mothers. This study uses a case report on one patient through the nursing process approach. Data collection techniques were carried out by interview, observation (history, patient subjective data), physical examination (result of physical examination) and documentation study (laboratory results, treatment). The instrument used uses the maternity nursing care format. The intervention focuses on ineffective breastfeeding by providing breastfeeding education and lactation counselling can be applied to postcesarean section mothers on the first day and the client's breastfeeding status improves on the third day. The baby's attachment to the mother's breast increased, the baby was not fussy on the third day of the intervention, the mother was able to give breast milk in the correct position, the milk supply was adequate, the baby's suction increased, the mother's anxiety decreased, and the mother's confidence increased. In conclusion, lactation counseling and breastfeeding education were able to solve the problem of ineffective breastfeeding on the third day of the intervention. Lactation counseling and early education during pregnancy will have a better impact on breastfeeding immediately after the baby is born.

Keywords: breastfeeding; postcesarean section; counseling; education

Background

Cesarean delivery is still the most common surgical procedure for women in Indonesia. A cesarean delivery if done correctly can save the life of both mother and baby.[1] However, the risk of cesarean delivery must still be considered because the risk of cesarean delivery is higher than vaginal delivery.

One of the effects of post cesarean section is pain. Post cesarean section pain that makes it difficult for the mother to provide the correct breastfeeding position and attachment results in delays in breastfeeding.[2] Delay in starting breastfeeding can cause breast milk to not come out smoothly, breasts to swell.[3]
The cesarean delivery rate continues to increase in both developed and developing countries. Data in 2017 shows an increase in the incidence of cesarean section in Indonesia, which increased from 12% in 2012 to 17% in 2017.[4] Cesarean births in Asia were ranked third in 2015 at 19.2%. This figure exceeds the WHO target of 10%-15%.[5]

The high rate of cesarean delivery is also influenced by previous cesarean history, where 86.7% of women with a history of previous cesarean delivery will do cesarean delivery for their next pregnancy. Mothers who have had a previous cesarean delivery will have a greater risk than mothers who have had their first cesarean section.[6,7]

Breastfeeding problems often occur in the early postpartum, especially for mothers who underwent postcesarean section.[8] Barriers to breastfeeding that are often encountered in postcesarean section mothers are limited mobilization due to pain during surgery, knowledge about breastfeeding, and readiness and support for breastfeeding.

Breast milk has many benefits that are needed by babies to support the baby's growth and development process. If the need for breast milk is inadequate, it will affect the baby's growth and development process. Because giving formula milk is not able to nutritional needs of babies as like contained in breast milk. Various efforts have been made to overcome the limitations of breastfeeding for mothers after cesarean section. This study presents a case report to determine the process of increasing ineffective breastfeeding in post-SC mothers.

Methods

This study uses a case study approach (case report) on one participant (patient) through the nursing process approach. A postcesarean section mother at RSUD Ibnu Sina Gresik in 2021 became the sample of this study. Data collection techniques were carried out by interview, observation (history, patient subjective data), physical examination (result of physical examination) and documentation study (laboratory results, treatment). The instrument used uses the maternity nursing care format. This approval and ethical clearance was obtained from Ibnu Sina Hospital Gresik at the beginning of the study (No: 071/053/437.76.46/2021).

Results and Discussions

Case Presentation

A 35 years old mother with a postcesarean section on the first day (P_{20011}). Cesarean section was performed with indications of oligohydramnios and severe pre-eclampsia. The patient's assessment found the following conditions: the patient anxiety, the nipples stand out, the milk doesn't radiate well (drip) and the breasts were hard. The patient said that she had breastfed his baby but the milk dripped and the patient also expressed ignorance of the correct method of breastfeeding. The patient feels unable to meet the nutritional needs of the baby due to the inability of breastfeeding. Mother and baby are in one room (rooming in). Inadequate attachment and breastfeeding position causes the baby to seem fussy while feeding, and the baby does not continue to suck milk.

The patient had never breastfed before so he did not have experience in offering breast milk. In her first pregnancy, the mother had an abortion at 9 weeks of gestation, making it difficult for the mother to breastfeed because she had never breastfed before. The patient has disturbed sleep patterns due to the need to breastfeed his baby at night, but the baby was still crying which causes fatigue and anxiety in the mother. The patient feels pain at the surgical site. The patient is able to do light mobilization (right and left tilt), but to sit was still needed help. While in the hospital the patient was accompanied by her husband.

The results of the physical examination showed the following results; Blood pressure: 150/90 mmHg with urine protein 150mg/dl (+++), pulse: 91x/minute, respiration rate: 20x/minute, temperature: 36.2^{o}C. The wound dressing after the cesarean section surgery looks clean and dry, uterine contractions were hard, the uterine fundal height was at the level of the center (umbilical).

The problem of ineffective breastfeeding was raised by researchers based on the data from the assessment. The focus of solving ineffective breastfeeding problems by providing breastfeeding education and lactation counseling. Breastfeeding education is carried out through the provision of information about breastfeeding based on the book on Maternal and Child Health. During the process of providing breastfeeding education, the researcher gave the patient the opportunity to ask questions. Researchers also provide support to increase patients' confidence in breastfeeding and invite their husbands to be involved in every activity. Researchers teach mothers about breastfeeding positions, how to attach and care for the right breast. The lactation counseling was carried out based on the observation of the desire and purpose of breastfeeding. Researchers listened to every breastfeeding problem experienced by the patient. Praise and appreciation are given by the researcher for every effort that has been made by the patient and teaches the right breastfeeding technique/method according to the patient's needs and abilities.

The nursing evaluation showed the results: the client's breastfeeding status improved, the baby's attachment to the mother's breast increased, the baby was not fussy on the third day of the intervention, the mother was able to give breast milk in the correct position, the milk supply was adequate, the baby's suction increased, the mother's anxiety decreased, and the mother's confidence increased.

Barriers to breastfeeding occur in post cesarean section mothers in this case report. The case report shows that the mother experiences anxiety due to her not being able

to give breast milk as expected. Mother's perception of inadequate breastfeeding leads to unpreparedness and disappointment of the mother which, if continued, causes anxiety and worry.[2,9] Some women report that breastfeeding difficulties and anxiety are worse than giving birth.[9]

Breast assessment shows the mother's breasts are firm. Improper breastfeeding techniques can cause the mother's breasts to harden. Incorrect breastfeeding techniques can cause hard or swollen breasts, sore nipples, and blocked milk.[10] Good breastfeeding technique increases baby's comfort in sucking, while baby's sucking affects milk production.[3]

The production of breast milk and the success of breastfeeding lies in the first 72 hours after delivery. Mothers who cannot breastfeed immediately or incorrect breastfeeding techniques cause a decreased response to oxytocin and prolactin because the nipples do not receive sufficient stimulation. So that the process of lactogenesis II is inhibited.[11]

Pain complaints were found in almost all mothers after delivery by cesarean section. Pain causes an uncomfortable feeling that can hinder the breastfeeding process. Pain is cited as the most frequent reason for inhibiting breastfeeding.[2] Pain reduces the mother's interest in breastfeeding. One-third of women who deliver by cesarean section consider that the ability to breastfeed is largely influenced by post-delivery pain.[12] Pain limits the interaction between mother and baby and limits breastfeeding activities. Mothers will become more passive in their mobilization so that the position of breastfeeding is not optimal.

Conditions after cesarean section surgery cause many problems that can hinder the process of breastfeeding. Lack of knowledge and skills in breastfeeding, physical limitations, lactation deficiency, lack of knowledge and skills in coping management after delivery hinder breastfeeding by mothers.[13]

The main problem raised by the researcher based on the results of the study was that ineffective breastfeeding. Ineffective breastfeeding is a condition where the mother and baby experience dissatisfaction or liking for the breastfeeding process, which is caused by physiological factors or situational factors.[14] Lactation counseling and breastfeeding education are given as interventions in an effort to overcome the problem of ineffective breastfeeding.[15]

Evaluation of the intervention shows the success of the intervention that has been given. As long as there are still problems with breastfeeding, lactation consultation by a counselor should still be given according to needs. Because one of the factors that influence the success of breastfeeding is this counseling program.[16] An effective lactation consultation not only improves general knowledge about breastfeeding, but also helps to overcome fear, and stress.[17]

Breastfeeding education increases the duration of breastfeeding.[11] Mothers who receive breastfeeding education have higher self-efficacy and better breastfeeding attitudes, so they have a higher chance of breastfeeding.[18]
Once at home, breastfeeding support should still be provided. Breastfeeding education given in the taking-in phase needs to be repeated when the mother has entered the taking-hold phase so that the education provided can be accepted and

applied by the mother. Mothers who receive repeated education at home will have a higher probability of exclusive breastfeeding.[19]

Conclusion

Providing effective lactation counseling and breastfeeding education interventions in overcoming ineffective breastfeeding nursing problems. Lack of access to information is an obstacle to the success of the intervention so it is necessary to carry out lactation counseling and breastfeeding education from the time of pregnancy. So that the baby can receive breast milk immediately after birth.

Declaration Section

This approval and ethical clearance was obtained from Ibnu Sina Hospital Gresik at the beginning of the study (No: 071/053/437.76.46/2021). The author's declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. In this research, the author contributions as the designers of the design study are Agus Sulistyono and Anestasia Pangestu Mei Tyas. Rosa Ayu Andini as data collection, Amellia Mardhika, Joko Susanto and Makhfudli Makhfudli as data analysis, Amellia Mardhika and Riris Medawati as manuscript writing.

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Flood emergency preparedness training among healthcare providers: a cross sectional study

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Abstract

Floods have a negative impact on all sectors of life. In 2019 there was a major flood disaster in Bengkulu Province which caused deaths, missing victims, physical damage, and deep trauma for the victims. Many health workers are assigned to provide direct assistance. However, there are some limitations due to lack of knowledge and lack of a basis for flood disaster preparedness. Capacity building and understanding of disaster risk is one way to reduce disaster risk. The purpose of this study was to determine the relationship between training and the preparedness of health workers to face flood disasters. The research design using cross-sectional. The research sample was all health workers on duty at the Bengkulu City Health Center as many as 40 people. The sampling technique used was total sampling. Data analysis consisted of univariate and bivariate analysis. Bivariate analysis using chi-square statistical analysis ($\chi 2$). The results showed (1) from 40 samples there were 18 people with moderate preparedness and 22 people with high preparedness; (2) From the 40 samples, there were 25 people who had never trained in flood disaster and 15 people had training in flood disaster. In conclusion, there is a significant relationship between training and the preparedness of health workers in dealing with flood disasters. It is hoped that the Puskesmas will provide regular preparedness training in order to increase the confidence of health workers in providing assistance when a flood disaster occurs.

Keywords: floods, preparedness, training, health workers

Background

Flood disasters that occur due to regional rainstorms are part of the type of natural meteorological disaster that can cause severe damage.[1] The Asian Disaster Reduction Center (DRC) with data collection based on the Analysis Emergency Event Database (EM-DAT) states that floods affected 5.26 million people in Asia from 1990-2019 resulting in 1.16 million deaths, and an economic loss of 1.47 million USD.[2] The number of deaths due to flooding in Indonesia has reached 206 of the total population,[2] this shows the high incidence of flooding in Indonesia and the Asian region. Physiographic conditions of the Indonesian region such as latitude, altitude, wind patterns, waters, and high mountains or mountains affect the variation and type of rainfall in several regions of Indonesia.[3]

Bengkulu is one of the areas in Indonesia that is prone to flooding. Bengkulu in particular has an extreme climate that affects the condition of geographical characteristics. The flood disaster that occurred in Bengkulu was caused by geographical conditions located between the Pacific Ocean and the Indian Ocean, there are three basic climate types, namely monsoon, equatorial, and local climate system.[4] This will cause a high rainfall pattern and the mountainous slope area facing west gets the largest rain because it is directly facing the Indian ocean which has winds originating from the southwest which are rich in water vapor.[5] Bengkulu Provincial Health also stated that Bengkulu Province is at an elevation of 0-16 meters above sea level with 70% flat topography, 30% small hills, and there are still many areas in the form of swamps.[6]

Flood events have occurred due to heavy rains that poured from April 26, 2019 afternoon to April 27, 2019 morning. Heavy rains caused floods and landslides in 9 districts, cities in Bengkulu Province. BNPB recorded that there were a total of 30 deaths, 6 missing, 4 injured, 12,000 displaced, and 13,000 people affected by the flood.[7] Wathinani (2021) stated that flooding in general can be associated with cyclones, tsunamis, global warming and climate change.[8] The trend of rising global average temperature will not reverse by the end of the 21st century, and the frequency of extreme weather conditions such as heat waves and heavy rains will continue to increase.[1] The hazards that can be caused by flooding are infectious diseases, morbidity, mortality, economic instability and ongoing psychosocial problems in the health care system.[8]

Since 2019, the city of Bengkulu, which serves as the provincial capital and the seat of government, has been flooded. According to data from the Bengkulu City BPBD in 2020, the worst-affected areas were in the city of Bengkulu, where two sub-districts were affected by the flood, namely Sungai Serut and Muara Bangkahulu villages in Tanjung Jaya, Tanjung Agung, Bentiring, Rawa Makmur, and Sawah Lebar villages, with a total of 1593 KK of communities affected. People are worried about the approach of unpredictable annual floods as the year comes to a close with the rainy season. Emergency preparedness is needed in dealing with affected victims. When there was a flood disaster in Bengkulu, there were still many health workers who were not ready to help. The contributing factors are lack of knowledge, inappropriate coordination system, and inadequate infrastructure. In accordance with the Bengkulu City BPBD performance report in 2020, it states that disaster management by related institutions is still not optimal. The management system carried out so far has not been based on systematic, planned steps and this condition is exacerbated by the lack of preparedness, response and disaster resilience.[9]

Research conducted by Direja and Wulan (2018) shows that out 60% health workers in all Bengkulu City Health Centers have never participated in disaster management training activities.[10] A similar study by Farley, et al (2017) regarding flood preparedness in government health facilities stated that several respondents expressed a desire for more clinical opportunities, especially disasters.[11] The importance of knowledge, skills regarding preparedness are owned by health workers before a flood event occurs. The purpose of this study is to determine the relationship between training and preparedness of health workers dealing with floods.

Methods

This study used a cross-sectional design. On the basis of the data, a sample of health professionals from the Beringin Raya Health Center was selected from among the city of Bengkulu's 20 health centers. The Total Sampling approach was used to select 40 respondents for this quantitative studys. the reason for taking the total population is because the number of samples is less than 100 participants [12,13] and all health workers say it is necessary to carry out training related to flood preparedness. Data collection techniques using primary data and secondary data. The analysis was carried out by Univariate and Bivariate. Bivariate analysis used chi-square (χ^2) statistical analysis. this research was conducted at the Beringin Raya Public Health Center in July-August 2021. This study uses a questionnaire containing the questions regarding the preparedness of health workers and disaster management training in the health sector. the questionnaire was adopted from the research Barliana (2019).[14] Data analysis using univariate analysis, research data are presented in the form of tables and narrative text The research procedure was that every health worker at the Puskesmas was used as a research sample. The research will be conducted if the consent has been obtained and signed the consent form. After that, the researcher will conduct an interview using a questionnaire. This research has obtained a research permit from the Bengkulu City Health Office with the number 070/859/D.Kes/2021.

Results and Discussions

The research data was obtained by interviewing 40 health workers of the Puskesmas. Characteristics of respondents including gender, age, education are depicted in table 1 which is shown by the majority of female gender 36 people (90%), most of them aged 23-32 years (72.5%), and education of most D3 graduates 26 people (65%). After the data were analyzed by univariate, bivariate, the following results were obtained. Based on univariate analysis, data on the frequency distribution of the preparedness of health workers to face flood disasters (table 2) mostly have preparedness in the moderate category as many as 22 people (55%). And the frequency distribution that has attended flood preparedness training is 25 people (62.5%) (table 3). Bivariate analysis (Table 4) shows a cross tabulation between flood disaster training and health officer preparedness, it turns out that from 25 people who have never had disaster training there are 16 people on moderate preparedness and 9 people and out of 15 people who have had flood disaster training there are 2 people with moderate preparedness and 13 people high preparedness. The results of the Chi-Square statistical test (Continuity Correction) obtained a value of 2 = 7.785 with a value of p = 0.005 < = 0.05, which means that it is significant, then Ho is rejected. Ha is accepted. So there is a significant relationship between flood disaster training and the preparedness of health workers.

Disaster management is very important to do, because with the knowledge possessed will be able to reduce the impact of disasters.[15] The results of the study from 40 samples there were 18 people with moderate preparedness in the face of flood disasters, namely 2 people said they had been training for too long so they had forgotten with preparedness material and 16 people said they had never attended preparedness training, namely 6 people said they had just moved work and 10 had never received a flood preparedness simulation.The results of this study are in line with the research of Emiliyawati, et al (2021) almost half of the respondents (45,77) %) have a low level of preparedness and this topic needs more attention from the government and health workers.[16] Another study by Gonlewicz, et al (2021) stated that respondents who participated in the study reported that they had low preparedness in effective disaster response.[17] And the results of the researchers an Farley, et al (2017) stated that the preparedness of medical officers regarding flooding is still lacking, only 4 facilities have disaster preparedness plans on existing human resources (12.9%).[11]

The results of the study were from 40 samples, there were 25 health workers who were used as research respondents who had never participated in flood disaster training activities because they had not received an assignment from the Health Care (Puskesmas) to take part in disaster preparedness training. Meanwhile, 15 people had training, namely 6 people for flood preparedness training, 3 people for first aid training in floods, 2 people for disaster preparedness training, and 4 people for disaster emergency training. The results of the study of 25 people who had never had flood disaster training there were 16 people who were in moderate preparedness because respondents who had never attended flood disaster training caused information about flood disaster preparedness so that this condition had an impact on the preparedness of health workers who were in the face of flood disasters. While there are 9 people with high preparedness because 3 health workers have attended counseling about flood disasters, 4 health workers have been involved in flood victims handling teams and 2 health workers have attended seminars on flood disasters so that these conditions have an impact on high preparedness. This is in accordance with the results of the 2018 Naseer & Salem research which states that some research respondents appear in a positive level towards emergency and disaster preparedness, and as many as 41% of all respondents have never received a disaster preparedness course at all.[18]

The results of the above study are in line with the research conducted by Al Wathinani, et al., (2021) showing that by providing disaster management training with the simulation method, it can improve preparedness behavior in the face of flood disasters.[8] Hospital preparation and availability trained health personnel will affect the disaster preparedness process. This is in accordance with research Rattanakanlaya, et al (2016) & Sri-On, et al (2019) which states that respondents in the hospital are still lacking ready for surge waves due to flood disasters, the availability of equipment is adequate but still lacking in the arrangement of trained personnel who have emergency response responses.[19,20]

The results of the Chi-Square (Continuity Correction) statistical test showed a significant relationship between flood disaster training and the preparedness of health workers. This means that flood disaster training conducted by health workers has a good impact on the preparedness of health workers in flood disasters. The results of this study are in line with the research of Tzeng (2016) which states that

providing training according to the needs of staff is one of the right efforts to improve disaster emergency response preparedness.[21] The same research show that there is an effect of training on flood preparedness. [22,23]. However, this study is inversely proportional to the results of Williams, et al., (2008) with the conclusion that training interventions for health care providers are less effective in increasing knowledge and disaster response skills.[24] the need for special attention regarding disaster management, the need for additional health workers in accordance with the Guidelines for Human Resource Management, the need for policies regarding program management efforts and supervision of disaster management starting from pre-disaster, during disaster and post-disaster and the need for training, rehearsals/simulations, in collaboration with cross-sectors, especially for health workers regarding disaster management.[25]

Conclusion

There is a significant relationship between training and disaster preparedness, p value < 0.05. The extraordinary impact of the disaster that occurred was caused by a lack of knowledge and skills regarding potential disaster vulnerability and mitigation in reducing its impact. Disaster training that has been carried out by health workers will be able to increase their confidence in efforts to increase flood disaster preparedness.

Declaration Section

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Tabel 1. Characteristics of respondents by gender, age, education

Characteristic of respondents	Frequency	Percentage (%)
Gender		
Woman	36	90
Man	4	10
Age		
23-32	29	72.5
33-42	7	17.5
43-52	4	10
Education		
D3	26	65
S1	8	20
D4	4	10
Nurses	2	5

Tabel 2. Distribution of the frequency of preparedness of health workers to face flood disasters

Preparedness of Health Workers	Frequency	Percentage (%)
Currently	18	45.0
High	22	55.0
Total	40	100.0

Tabel 3. Distribution of Flood Disaster Training Frequency to Health Officers

Flood disaster training	Frequency	Percentage (%)
Never	25	62.5
Ever	15	37.5
Total	40	100.0

Tabel 4. Relationship between flood disaster training and preparedness of health workers

Flood Disaster Training	Preparedness						χ^2	p	C
	Currently		High		Total				
	F	%	f	%	f	%			
Never	16	64.0	9	36.0	25	100.0	7.785	0.005	0.442
Ever	2	13.3	13	86.7	15	100.0			
Total	18	45.0	22	55.0	40	100.0			

The impact of TeamSTEPPS training on nursing staff perceptions of leadership in the inpatient hospital unit

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Abstract

Nursing care holds the biggest portion in hospital services, so as to increase patient safety. One of the factors that influence patient safety is leadership. One of the interventions that has been proven effective and can be done in improving patient safety is TeamSTEPPS but the effect of the application of TeamSTEPPS on nurse leadership in hospitals in Indonesia is still unknown. The purpose of this study was to determine the effect of the implementation of TeamSTEPPS on nurse leadership in hospitals. This study uses quasy-experimental research pre-post test with control group design. The sample included 28 nurses as experimental group and another 28 nurses in the control group. The instrument was the TeamSTEPPS questionnaire from the Agency for Healthcare Research & Quality (AHRQ) Analysis techniques used mann whitney and Wilcoxon test. The result showed that Perception score obtained Z count value greater than -Z table (-0.366> -1.960), and p-value is greater than α (0.714> 0.050). The Z value is greater than -Z table (-0.297> -1.960), and the p-value is greater than α (0.766> 0.050. The average increase in the perception of the intervention group is the same as the increase in the perception of the control group on the leadership variable and the difference is not significant. There is no significant difference in the average before and after being given TeamSTEPPS training based on the leadership perception score measured in the intervention group and there is also no significant difference between groups based on measured perceptual improvements. It can be concluded that the application of TeamSTEPPS had no significant effect on nurses' perception of leadership in hospital

Key words: TeamSTEPPS training, leadership perceptions, nursing management

Background

Patient safety is currently a top priority in the health care system related to the issue of quality and credibility of the hospital.[1] In an effort to carry out patient safety, it is very possible that errors occur in providing nursing care.[2] Nursing care holds the biggest portion in hospital services, so as to increase patient safety.[3] One of the factors that influence patient safety is leadership.[4] For this reason, efforts to improve leadership are needed. One of the interventions that has been proven effective and can be done in improving patient safety is TeamSTEPPS (Team Strategies and Tools for Enhance Performance and Patient Safety).[5] This intervention demonstrates the effectiveness of leadership skills training after being given training.[6] In Indonesia, TeamSTEPPS is still not well known by nurses in hospitals because research related to TeamSTEPPS is still not widely done, so the effect of the application of TeamSTEPPS on nurse leadership in hospitals in Indonesia is still unknown.

The publication on research carried out by hospitals in America, New Zealand, Canada, Australia and Europe found KTD in the range of 3.2% - 16.6%.[7] The National Patient Safety Agency (2017) reports that in the January-December 2016 timeframe, the patient safety incidence reported by the United Kingdom was 1,879,822 incidents.[8] Whereas in the United States medical errors rank eighth cause of death in hospitalized patients reaching 33.6 million per year, including reported deaths each year.[9] In the Patient Safety Incident report in Indonesia, the number of reports increases every year, including 145 cases in 2007, 61 cases in 2008, 114 cases in 2009, 103 cases in 2010, and in the period January - April 2011 as many as 34 cases. In 2010, the number of IKP reports at local government hospitals was higher than that of private hospitals, which was 16.45%. The number of IKP reports in general hospitals is also higher than in special hospitals, which is 25.69% in 2010 and 27.79% in 2011.[10]

The nurse's leadership role in Indonesia in encouraging patient safety programs is still poor. The quality of nursing leadership was good at 54.2%, while the quality of nursing leadership was not good at 45.8%.[11] Other research conducted by Sinurat (2018) shows the role of the leadership in the field of nursing services in encouraging patient safety programs, found that the majority of respondents stated well as many as 74 people (51.7%), followed by respondents who stated that as many as 49 people (34.3%), and those who stated less than 20 people (14.0%).[12]

One of the factors that can be the cause of the high number of IKP is safety culture. The culture of patient safety is influenced by 3 main factors namely attitudes and behavior (senior management, middle management, supervisors, employees, representative safety and health and commitment of committee members), environment (type of organization, financial, type of work performed, job design, speed work, available training, communication lines) and systems (the process of reporting events / incidents that threaten patient safety, the audit process, the investigation process, communication and feedback systems).[13] So to create a culture of patient safety from all walks of life from the commitment of the leadership to the employees must be addressed. Research studies have shown that good leadership has a significant relationship with better work safety behavior and reduces accident rates and increases safety compliance.[14]

Leadership can be improved through the provision of training.[15] One of the trainings that has been proven effective and can be done in improving patient safety is TeamSTEPPS (Team Strategies and Tools for Enhance Performance and Patient Safety).[5] TeamSTEPPS is an intervention to improve patient safety that focuses on specific skills that support the principles of team performance, including training requirements, behavioral methods, human factors, and cultural changes designed to improve patient quality and safety.[16] Research shows an increase in leadership after being given TeamSTEPPS training, which is used to develop leadership skills when working in interprofessional health teams.[17] In line with research conducted by Castner (2012), where TeamSTEPPS research related to leadership shows significant differences with higher leadership scores.[18] Based on the above background, the researcher is interested to find out more about the influence of the application of TeamSTEPPS on nurse leadership at the hospital. The purpose of this study was to determine the effect of the implementation of TeamSTEPPS on nurse leadership in hospitals.

Methods

This study uses quasy-experimental research pre-post test with control group design. Participants in this study were all nurses in the Inpatient Room of Universitas Brawijaya Hospital and Muhammadiyah University Hospital Malang Indonesia during November 2019 until Februari 2020. The sampling technique used in this study is a non-probability purposive sampling. Inclusion criteria were States willing to take part in research, work in the same inpatient unit for at least 3 months, all nurses who carry out nursing care directly to patients, and work for 40 hours per week. The sample included 28 nurses as experimental group who were given TeamSTEPPS trainning and another 28 nurses in the control group. The instrument used to assess nurses' perception of leadership in the treatment and control groups was the TeamSTEPPS questionnaire from the Agency for Healthcare Research & Quality (AHRQ) which was translated into bahasa Indonesia which consisted of 7 item. The items are to be marked by respondents along a likert type of rating scale (strongly agree=5, agree=4, neutral=3, disagree=2, strongly disagree=1). The reliability coefficient of this inventory has been calculated as 0.959 validity is found to be acceptable which were > 0,301. Analysis techniques used the SPSS 22 for Windows application program using the Independent T test to compare data between the control group and the experimental group. Meanwhile, to compare the pretest and posttest data of nurse leadership in the experimental group and the control group, a paired T test was used.

Results and Discussions

Respondent Characteristics

From the results of the study, the characteristics of respondents based on the sex of nurses in the control and intervention groups are presented in the table 1. The characteristics of respondents in the control group were female 12 respondents (42.9%) and 16 respondents (57.1%) while in the intervention group were men 5 respondents (17.9%) and 23 respondents (82.1%). The age of nurses in the control group was 20-30 years old with 23 respondents (82.1%), aged 31-40 years with 5 respondents (17.9%), and none were over 40 years old, whereas in the intervention group respondents aged 20-30 years were 20 respondents (71.4%), aged 31-40 years were 8 respondents (28.6%), and also none were aged over 40 years. Education level was bachelor degree as many as 13 respondents (46.4%) in the

control group and 16 respondents (57.1%) in the intervention group, respondents with the level education were diploma as many as 15 respondents (53.6%) in the control group and 12 respondents (42.9%in the intervention group. Respondents with length of work in hospital less than 1 year were 8 respondents (28.6%) in the intervention group, respondents with length of work in hospitals 1 to 5 years were 18 respondents (64.3%) in the control group and 20 respondents (71 , 4%) in the intervention group, and respondents with length of work in hospitals 6 to 10 years were 10 respondents (35.7%) in the control group.

The Impact of TeamSTEPPS Training on Nursing Staff Perceptions of Leadership

Based on the Wilcoxon Test results on the pre-test and post-test questionnaires to determine differences in leadership in the intervention groups that have been obtained, presented in the table 3. Perception score obtained Z count value greater than -Z table (-0.366> -1.960), and p-value is greater than α (0.714> 0.050). In the attitude score, the calculated Z value is greater than –Z table (-1.632> -1.960), and the p-value is greater than α (0.103> 0.050). Pre-test and post-test data that have been obtained in the control group and the intervention group were analyzed using the Mann Whitney test where the test was used to determine the effect of the implementation of TeamSTEPPS by nurses on nurse leadership in hospitals. The Z value is greater than -Z table (-0.297> -1.960), and the p-value is greater than α (0.766> 0.050), so it can be concluded that there is no significant difference between groups based on measured perceptual improvements. The average increase in the perception of the intervention group is the same as the increase in the perception of the control group on the leadership variable and the difference is not significant.

Factors that can affect the ineffectiveness of TeamSTEPPS training in this study can be caused by the modified training duration to be shorter due to time constraints, while in the AHRQ guide the effective duration of training is 7.9 hours.[16] In addition, the duration of the workshop is also less than optimal because it only lasts 2 hours, while based on the AHRQ standard it says that the effective duration of the TeamSTEPPS workshop is 4-6 hours. This is in line with AHRQ's identification that lack of time is an obstacle to effective teamwork.[19] The lack of nurse commitment is also an obstacle to success, such as during the training there were some participants who came late, left the room while the material was in progress, and left before the material ended, so they could not receive the training optimally. This is in accordance with research which states that one of the inhibiting factors for the successful implementation of TeamSTEPPS is the lack of support from Human Resources (HR).[20]

Conclusions

The application of TeamSTEPPS had no significant effect on nurses' perception of leadership in the intervention group, as seen from the p-value of each pre-post comparison test that was greater than 0.05. The application of TeamSTEPPS had no significant effect on leadership in the control group, as seen from the p-value of each pre-post comparison test that was greater than 0.05. The average increase in the score of the leadership group of the intervention group and the control group did not differ significantly, as seen from the significance value of each test increase in variables greater than 0.05.

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Table 1. Characteristics of respondents

Characteristics		Control Group (n=28)		Intervention group (n=28)	
		F	%	F	%
Sex	Male	12	42.9%	5	17.9%
	Female	16	57.1%	23	82.1%
Age	20-30	23	82.1%	20	71.4%
	31-40	5	17.9%	8	28.6%
	41-50	0	0.0%	0	0.0%
	> 50	0	0.0%	0	0.0%
Employment status	Povernment employees	0	0.0%	1	3.6%
	Non-government permanent employees	28	100.0%	21	75.0%
	Internship	0	0.0%	1	3.6%
	Others	0	0.0%	5	17.9%
Education level	Bachelor degree	13	46.4%	16	57.1%
	Diploma	15	53.6%	12	42.9%
length of working	< 1 year	0	0.0%	8	28.6%
	1-5 year	18	64.3%	20	71.4%
	6-10 year	10	35.7%	0	0.0%
	11-15 year	0	0.0%	0	0.0%
	16-20 year	0	0.0%	0	0.0%
	> 21 year	0	0.0%	0	0.0%

Table 2. Differences between pre-test and post-test nurses' perception of leadership

	Variabel	Z	p-value
Perception	Pre-Test	-0.366	0.714
	Post-Test		
Attitude	Pre-Test	-1.632	0.103
	Post-Test		

Table. 3. Nurses' perception of leadership between intervention and control groups

Group	Mean	N	Std. Dev	Z	p-Value
Control	0.2500	28	4.60776		
Intervention	0.2500	28	7.10047	-0.297	0.766

The correlation between the accuracy of documentation early warning system (EWS) by nurses to the outcome of patients in the VIP inpatient room

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Abstract

The accuracy of the documentation Early Warning System (EWS) by nurses on patient outcomes must be done appropriately. But in reality, there are still many nurses who are not quite right in documenting of the Early Warning System (EWS). Many factors affect the accuracy of the documentation Early Warning System (EWS) toward outcome patients who care and knowledge of nurses. The purpose of this study was to determine the relationship between the accuracy of the documentation Early Warning System (EWS) by nurses on patient outcomes. The design of this study uses descriptive correlations with a retrospective cohort. The sample used in this study was Incidental Sampling from 57 nurses' medical records. The instruments of this study were the patient demographic sheet, the EWS documentation sheet and the code blue minutes. The Spearman Rank statistical test results there is a correlation between the accuracy of the documentation EWS with patient outcome ($p = 0.024$; $r = 0.858$) with the direction of the higher accuracy of EWS, the higher the patient safety. The conclusion of this study is that there is a relationship between the accuracy of the documentation EWS with patient outcomes. It is recommended that documentation of EWS is very important for patient outcomes. Thorough training is needed so that it can improve patient safety. So that the training and supervision can improve the accuracy of the documentation of EWS which can lead to improvements in patient outcomes.

Keywords: Early Warning System documentation, patient outcomes

Background

Rapid movement on improving healthcare quality has been widely promoted by hospital accreditation. In general, hospital health services have expected outcomes, including: mortality, patient readmission rates, patient outcomes, patient satisfaction, effective care, timeliness of care, and appropriate use of imaging technology.[1] From these outcomes, the most important thing is the mortality rate and patient outcome.[2] The hospital management support to improve the best patient outcomes are to recognize, respond to and treat worsening of the patient's condition early to prevent cardiac arrest and unanticipated death.[3] Therefore, Early Warning System (EWS)is come to place to identified this sudden worsening condition of patients so it will not lead to unanticipated death. Early warning system is a systematic process to evaluate and detect abnormal patient's condition early by measuring five physiological parameters of the patient (heart rate, respiratory rate, systolic blood pressure, body temperature, and level of consciousness).[4] Along with the EWS, Rapid Response Team and Code Blue were also prepared as the follow up response to the system. This system is considered effective because the rapid response can prevent the failure of the compensatory mechanism due to worsening of the patient's condition. [5] A systematic review found that there were 6 studies which stated that mortality rates decreased after the implementation of EWS.[6] Other studies that implement modified EWS also stated that its proper documentation lower the mortality rate and improve safety outcomes of the patients.[7] This highlights the importance to assess the implementation of EWS in Indonesian Hospitals.

Several hospitals in Indonesia have implemented EWS to prevent a decline in the patient's condition and sudden death of the patient. The implementation of EWS in Indonesian Hospitals has been carried out in the Intensive Care room. The implementation of EWS is still not optimal, because there are still many occurrences of a decline in the condition of patients in hospitals in Indonesia which is known to be late.[5, 8, 9] The optimal implementation of the EWS is influenced by the level of nurse compliance and the accuracy in carrying out the EWS according to the Standard Operating Procedure (SOP).[10] The success of implementing the EWS procedure also depends on the nurse's level of knowledge of the EWS procedure.

In our preliminary study, there was a lack of accuracy in the implementation of EWS by nurses in the pavilion, especially in documenting EWS because only 8.02% of workers received EWS exposure. Patients who experience a decline in their condition are known to be slow and even the unanticipated death rate in this hospital is high due to the lack of coherent documentation causing delays in reporting to the DPJP for early treatment of worsening patient conditions. Based on patient outcome data in the inpatient ward of the main service installation, from September 2018 to March 2019 there were 68 patients who experienced a decline in condition[11]. The data suggest the urgency to examine the accuracy of EWS documentation and its correlation to patient outcomes in our hospital.

Method

Retrospective cohort design was used to examine the correlation between the Accuracy of Documentation Early Warning System (EWS) by Nurses to the Outcome of Patients. Our population was patients' health record of VIP room who experienced a decrease in condition with an EWS score >2 as many as 66

respondents in the last 3 months, namely from September to the second week of November. The accuracy pf EWS Documentation was measured using checklist consisting of EWS parameter measurement accuracy, providing correct colour according to the number of scores, and follow up precision. Whilst, Patient outcomes was identified from News of the call for code blue, Patient medical record, Reports from enumerators for each room (reports of sudden ICU transfer without any indication of deterioration in progress records)

Results and Discussions

Table 1 shows the respondence characteristics of the study. Table 2 describes the accuracy of EWS Documentation in correlation to patient outcomes. Based on the results of the study that there is a relationship between the accuracy of the Early Warning System (EWS) documentation and patient outcomes, namely the accuracy of documentation on the EWS parameter scoring, filling in the color code according to the number of scores and filling in the RTL. If only one of them is documented then it is considered inaccurate. This is in accordance with research there is a relationship between the implementation of EWS on the incidence of cardiac arrest.[12] In this study, it was explained that the inappropriate implementation of EWS could lead to unexpected outcomes.[13] Inadequate EWS documentation is associated with poor outcomes that affect the general condition of the patient. The implementation of EWS can increase if the rapid response is higher to patient outcomes.[14]

One of the factors that affect the inaccuracy of EWS documentation is ineffective communication. Communication can be orally or in writing. If it is in writing, it is with documentation. EWS documentation that is not coherent will affect the reporting of the patient's condition to the DPJP as well as not being coherent, thus causing delays in decision making or DPJP follow-up. The documentation of a good EWS implementation begins with communication between nurses to ask for help and hand over patients during patient transfers.[15] Efforts to improve service quality and accuracy of documentation require good implementation accuracy and regular reporting.

Patient outcomes require good management with the right functions, namely planning functions, organizing functions, mobilization functions and control functions.[16] Based on research the factors that influence patient outcomes are management with a control function.[17] Based on the above, the accuracy of EWS documentation has an effect on patient outcomes. Documentation of the EWS will be written evidence of the actions that have been taken for patients who experience a decrease in condition. With proper and coherent EWS documentation, it will become an effective written communication medium for patient medical records between nurses and DPJP as well as between nurses in each shift so that all PPA can know the progress of the patient's condition at any time. And if there is a change in conditions at any time, the nurse can immediately determine the initial treatment and what follow-up plans are needed. So it does not result in a worse patient outcome.

Conclusion

The proper implementation of EWS documentation is correlated with patient outcomes in this case mortality rate, sudden ICU transfer and patient stay in inpatient room. There is a need for further prospective research on the appropriateness of the implementation of the EWS on patient outcomes so that it can be known with certainty about the process of implementing EWS and the factors that influence patient outcomes.

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Table 1. Respondence characteristics of the study

Respondent chracteristics	N=57	%
Age		
< 35 years old	6	10.5
36-40 years old	1	1.8
41-50 years old	12	21.1
>50 years old	38	66.7
Gender		
Male	27	47.4
Female	30	52.6
Readmission		
First admission	35	61.4
More than 1 admission	22	38.6

Table 2. The accuracy of EWS Documentation

EWS Documentation Accuracy	*Outcome*			Total
	Died	ICU transfer	Obseervation	
Not accurate	4	0	2	6
Less Accurate	25	9	10	44
Accurate	4	1	2	7
Total	33	10	14	57

Nursing students' perception and satisfaction of online learning during COVID-19 pandemic

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Abstract

COVID-19 pandemic shifts learning methods in the nursing education, from traditional to online learning. Online learning has become the main method used during the pandemic to avoid interaction, thereby helping to reduce the risk of exposure to SARS-CoV-2. This study aimed to explore nursing students' perception and satisfaction of online learning during COVID-19 pandemic. A modified questionnaire was distributed to 142 nursing students at School of Nursing Universitas Brawijaya via web-based survey. The results show most (48.59%) students stated that online learning was quite effective in increasing knowledge in the field of nursing. Meanwhile, in terms of improving clinical skills, the majority of students (45.07%) thought that online learning was less effective in increasing students-students interaction and students-lecturers interaction. In term of satisfaction, 35.07% students are quite satisfied with the online learning process during pandemic. Statistical analysis shows a significant correlation between perception and satisfaction of online learning (p value=0.000; r=0.537). In conclusion, online learning is thought to be a powerful tool for teaching nursing students, especially in increasing knowledge and basic concepts. However, the use of traditional methods to improve the practice of clinical skills and student social interactions still needs to be considered.

Keywords: perception, satisfaction, online education, COVID-19 pandemic

Background

The Corona Virus Disease (COVID-19) pandemic shifts the approach to the learning process.[1] COVID-19 pandemic become the starting point that forced all universities in the world, including Indonesia to change traditional face-to-face learning into online learning simultaneously.[2-4] Indonesian government also make the policy of using the online learning in the hope of suppressing the spread of the SARS-CoV-2 virus as the cause of COVID-19.[5] Distance learning guidelines have also been developed to support the implementation of the policy.[6]

Online learning can also be considered as a natural evolution of distance learning, which is always making use of the latest emerging tools in the context of technology for educational structuring.[7] There are two learning process provided by the online learning, namely synchronous, which allows teachers and participants to interact directly using technology such as video conferencing in real time, and asynchronous online learning that has the power to facilitate social relationships and provide opportunities for direct feedback.[8-10] The synchronous method requires students and lecturers to use higher technology and good internet access, which is considered as a challenge by most of the students. On the other hand, there are less requirements for the students, but the main drawback is that students cannot ask questions in real time.[10]

Learning in nursing is consists of knowledge and practical skills, especially to support the implementation of nursing care. Online learning alone is known to not exceed face-to-face patient simulations, which in turn makes it difficult to achieve the expected skill competencies.[11] Another obstacle is the fact that online learning is not always accepted by nursing students because of the complex requirements.[12] As online learning is considered to be the new approach in the nursing education, knowledge about students' perception of online learning is essential to ensure the quality of nursing education. Perceptions of how to benefit from online learning systems have been shown to influence student satisfaction.[13] Furthermore, student satisfaction has a positive effect on student learning achievement.[14] This study aimed to explore nursing students' perception and satisfaction of online learning during COVID-19 pandemic.

Methods

This study is a descriptive correlational study with a cross sectional approach. 142 nursing students from School of Nursing, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia were recruited to this study after signed an informed consent. This study obtained ethical approval from the Health Research Ethics Committee of Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia.

Primary data were collected using a web-based survey. A modified questionnaire has been used to collect data from the respondents. The questionnaire consists of three sections. In the Section A, students were required to enter the personal information (age, gender, year of study, IT skills). Section B consist of 4 questions about perception of online learning. Students were given 5 sets of option using the Likert scale. Section C consist of 4 question to describe the students' satisfaction towards online learning.

The data were analyzed using IBM SPSS Statistic 25. Characteristics of respondents were analyzed using descriptive statistics. Spearman Rank test was used to analyze the correlation between students' perception and satisfaction of online learning. p value <0.05 was considered statistically significant.

Results and Discussions

Characteristics of Respondents

The characteristics of nursing students are summarized in Table 1. Among 142 students, most of the students were female (73; 83.80%). The age of the students ranges from 18 to 34 years old. A total of 73 (51.41%) were 18-20 years old, 68 (47.89%) were 21-30 years old, and only 1 student (0.7%) were 30-34 years old. Most of the students describe their IT skills as moderate (124; 87.32%).

Nursing Students' Perception of Online Learning

The average score of students' perception towards online learning was 10.31±2.65 with the minimum score of 4 and maximum of 20 (Table 2). Further exploration on each domain of perception, most students (48.59%) stated that online learning was quite effective in increasing knowledge in the field of nursing. Meanwhile, in terms of improving clinical skills, the majority of students (45.07%) thought that online learning was less effective in increasing interaction between students and students and between students and lecturers.

The COVID-19 pandemic has caused a paradigm shift in the education system in Indonesia, which previously still used traditional face-to-face learning methods. Online learning is considered the most effective method for providing education and at the same time controlling the spread of the COVID-19 disease. However, there are still some limitations in the implementation of online education, especially in nursing education. Online learning is considered less effective in improving students' clinical skills.[15] This is because during online learning, students do not get direct clinical experience in the laboratory or hospital.[16] Although some online skills learning methods, such as video conferences with experts, case studies, and online client handling simulations have begun to be developed, these methods are still considered unable to replace student experience to hone skills directly.[17]

Another limitation in online learning is in terms of social interaction.[18] The results of this study indicate that most of the students (42.96%) think that online learning is not effective in improving students' social skills. In online learning, students cannot interact directly with lecturers and other students, thus allowing for estrangement in relationships and a lack of concern between students and students, as well as students and lecturers.[19] This result is also in line with the previous research which states that one of the impacts of online learning is the lack of communication between teachers and students.[20]

Nursing Students' Satisfaction of Online Learning

The average score of students' satisfaction towards online learning was 10.96±3.36 with the minimum score of 4 and maximum of 20 (Table 2). Further analysis showed 60 students (42.25%) were likely to register for online classes, 58 students (40.85%) were likely recommended online classes, and 64 students (45.07%) were satisfied with the online learning.

This result is in accordance with the previous study conducted to identify students' satisfaction towards online learning technique. Most of the respondents are very

satisfied with the quality of teaching using the media Web Video Conferencing Teaching (WVC).[21] Furthermore, 43% students believe that online learning is quite recommended to be used later, even when the pandemic is over. When students have satisfaction with something such as technology, it is likely that students will tend to continue to use it to support the learning process.[22]

Correlation between Perception and Satisfaction of Online Learning

Nursing students' perception is positively correlates with satisfaction of online learning (p=0.000; r=0.537) as shown in Table 3. Positive perceptions are expected to have high satisfaction of online learning. There have been many studies that describe student perceptions related to online learning, but not many have associated it with satisfaction with online learning itself. One example is the research conducted in 2011 that tried to assess student perceptions of support for implementing online learning and its effect on satisfaction and learning outcomes. The study showed that students' perception of support for implementing online learning have a strong relationship with overall satisfaction of online learning.[23]

Conclusion

This study found that there was a significant relationship between students' perception and satisfaction of online learning. Online learning is thought to be a powerful tool for teaching nursing students, especially in increasing knowledge and basic concepts. However, the use of traditional methods to improve the practice of clinical skills and student social interactions still needs to be considered.

Declaration Section

The authors declare no potential competing interests. This study was approved by the Health Research Ethics Committee Faculty of Medicine Universitas Brawijaya Malang, Indonesia (180/ES/KEPK/06/2021)

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Table 1. Characteristics of respondents

Characteristics	Total (n)	Percentage (%)
Age		
18-20	73	51.41
21-30	68	47.89
31-34	1	0.7
Gender		
Male	23	16.20
Female	119	83.80
Year		
1st year	65	45.77
2nd year	18	12.68
3rd year	42	29.58
4th year	16	11.27
IT skills		
Poor	5	3.52
Moderate	124	87.32
Good	14	9.86

Table 2. Students' perception and satisfaction of online learning

Variable	Min	Max	Mean	SD
Perception of online learning	4	20	10.31	2.65
Satisfaction of online learning	4	20	10.96	3.36

Table 3. Correlation between perception and satisfaction of online learning

	Satisfaction of online learning
Perception of online learning	r=0.537 p=0.000 n=142

Community coping strategies in dealing with people with mental disorders

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Abstract

Coping strategies can improve the community's adaptability, allowing it to better assist in the treatment of people suffering from severe mental illnesses. In this study, the community's coping strategies for caring for people with severe mental disorders include treatment policies, social cohesion, mental health services, and the local economy status. This article provides an overview of community coping strategies that can be used to assist people with severe mental illnesses in their daily lives. This is a descriptive study that uses an observational survey approach to describe the characteristics of community coping strategies in assisting the care of people with severe mental disorders in the community. This study included 205 participants from the Bantur Community Health Center in Malang, including community leaders, health cadres, and neighbors. According to this study, the community's coping strategies are generally good. Neighbors have a higher percentage of indicators of social cohesion (75.6 %), mental health services (85.6 %), and community economic status (60 %). Meanwhile, health cadres have good coping strategies in terms of care policy (76.4 %). Community coping strategies can be carried out through existing and community-owned resources. Therefore, it can be concluded that it is important for the community to increase the resources they have in order to be able to improve their coping skills in helping people with severe mental disorders.

Key words: community, coping strategies, mental disorders

Background

The growing number of people with severe mental disorders in society necessitates positive support from all parties in order for them to be productive and self-sufficient. However, the persistent stigma and discrimination are the most significant impediments to community coping strategies in responding to the presence of sufferers who live nearby. Indeed, many of them are said to have been subjected to violence.[1,2] Social support is an important factor in both community coping strategies and community adaptation. People's acceptance of the problems they face, as well as their efforts to improve their quality of life, are referred to as social support. People who can provide social support and feel valued by others through their roles will continue to help people with severe mental disorders. Families, caregivers, health-care professionals, and the entire society must all be taken into account.[1,3] According to a previous study, caregivers' burden increases due to having other responsibilities, poor resources, lack of

financial support, poor education level, and ageing.[4] Caregivers face a great deal of stress, which can lead to the use of unhealthy coping strategies.[5] Coping strategies can improve the community's adaptability, allowing it to better assist in the treatment of people suffering from severe mental illnesses. In this study, the community's coping strategies for caring for people with severe mental disorders include treatment policies, social cohesion, mental health services, and the local economy status. This article provides an overview of community coping strategies that can be used to assist people with severe mental illnesses in their daily lives.

Methods

This is a descriptive study that uses an observational survey approach to describe the characteristics of community coping strategies in assisting the care of people with severe mental disorders in the community. This study included 205 respondents from the Bantur Community Health Center in Malang, including community leaders, health cadres, and neighbors through a purposive sampling technique. The instrument used was a questionnaire, and the data were analyzed descriptively using SPSS 20.0.

Results and Discussions

According to this study, the community's coping strategies are generally good. Neighbors have a higher percentage of indicators of social cohesion (75.6 %), mental health services (85.6 %), and community economic status (60 %). Meanwhile, health cadres have good coping strategies in terms of care policy (76.4 %). Cadres in this area are mental health cadres who are actively involved in socializing to the community about the importance of mental health and how the community can help care for people with mental disorders in the smallest way. The cadres also educate the community on the various changes that occur among people with severe mental disorders, both positive and negative, so that people can immediately report to the cadres if they need help communicating with the family. In addition, if additional treatment is required, mental health cadres forward patient information to health professionals. A good community coping strategy will determine the extent to which they can adapt.

The presence of a key person in the community is thought to be the community's backbone in all decision-making. The most influential figure is the person who can be nurtured, such as community leaders, community health center officers, religious leaders, and spiritual leaders. Existing community leaders have a significant impact on rural communities' lives. A community leader is one of the administrators who assists community activities in the village. This is in line with previous study, which found that important figures in society must be involved in improving the goals to be achieved. This figure serves as a role model for community members, motivating them to increase social participation and aid in the implementation of development initiatives.[6,7,8] In rural communities, they are dependable, charismatic, and influential people. Communities also have a proclivity to act in the manner in which they are exemplified. This character has the ability to prioritize and complete tasks within the allotted time, as well as the ability to maintain self-control when confronted with other members of society.[9,10] The study area's residents are rural communities who still regard their neighbors as the closest people who can help each other when they are in trouble. As a result, if a conflict arises, it is resolved through deliberation and consensus among community leaders and other village officials.

Conclusion

Community coping strategies can be implemented using existing and community-owned resources. In this study, the community's coping strategies to help care for people with severe mental disorders include health care policies, social cohesion, mental health services, and the community's economic status.

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Table 1. Community coping strategies in helping people with severe mental disorders

Indicator	Categories	Community leaders (n=60)		Health cadres (n=55)		Neigbours (n=90)		Total (n=205)	
		n	%	n	%	n	%	n	%
Policy of health care	Poor	0	0	0	0	0	0	0	0
	Fair	0	0	0	0	0	0	0	0
	Good	45	75	42	76.4	68	75.6	155	75.6
	Excellent	15	25	13	23.6	22	24.4	50	24.4
Social cohesion	Poor	3	5	3	5.5	4	4.4	10	4.9
	Fair	12	20	11	20	18	20	41	20
	Good	45	75	41	74.5	68	75.6	154	75.1
	Excellent	0	0	0	0	0	0	0	0
Mental health care services	Poor	0	0	0	0	0	0	0	0
	Fair	0	0	0	0	0	0	0	0
	Good	51	85	46	83.6	77	85.6	174	84.9
	Excellent	9	15	9	16.4	13	14.4	31	15.1
Community economic status	Poor	0	0	0	0	0	0	0	0
	Fair	0	0	0	0	0	0	0	0
	Good	36	60	32	58.2	54	60	122	59.5
	Excellent	24	40	23	41.8	36	40	83	40.5

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