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KNOWLEDGE, ATTITUDE, AND BEHAVIOR TOWARD SMOKING AMONG MEDICAL STUDENTS IN UNIVERSITAS SUMATERA UTARA

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ABSTRACT

Introduction: Tobacco consumption is one of the important contributing factors of non-infectious mortality in Indonesia. Factors causing young people to smoke include personality, parents, and colleagues. Medical students should have good knowledge about tobacco, an attitude that supports smoking avoidance and supports smoking cessation, and be role models for society by not smoking. The aim of this study is to determine about knowledge, attitude toward smoking habit, and smoking behavior among the medical students of Universitas Sumatera Utara.

Method: This is a descriptive-analytical study with cross-sectional approach, conducted at Medical Faculty of Universitas Sumatera Utara (USU) from March to December 2020. Participants are 100 medical students chosen randomly using stratified random sampling. Data are collected directly from the questionnaire in the form of Google Form sent to participants. Bivariate analysis was done using Chi-Square and Fisher's exact test. **Result:** shows the prevalence of smoking is 16%. For knowledge, 75% of respondent's knowledge about tobacco is average, 22% respondents have good knowledge, and 3% respondents have poor knowledge. Attitudes toward tobacco avoidance are positive in 63% respondents and negative in 37% respondents. Smoking behavior of 37.5% smokers is high, 31.25% average, and 31.25% low. Bivariate analysis finds significant correlation between smoking status and gender, smoking peer, and attitude. **Conclusion:** majority of USU medical students have average knowledge about tobacco, positive attitude toward smoking avoidance, and high smoking behavior. Significant correlation found indicates the need to raise awareness of smoking hazard and effort in ceasing smoking behavior among medical students.

Keywords: knowledge, attitude, behavior, medical students, smoking

INTRODUCTION

Overall, there are 1,4 billion tobacco users aged 15 years old and above throughout the world, in which 1.07 billion smokers and 367 million smokeless tobacco (World Health Organization, 2019). In Indonesia, the prevalence of smoking is 29%. The province with the highest smoking prevalence is West Java, which has 32.7% and the lowest smoking prevalence is Papua, which has 21.9%. Data from 2013 show that the number of male and female smokers seems to be increasing. In 2013, prevalence of adult male smokers increased from 65.8 in 2010 to 66% and female smokers from 4.1% to 6.7% (Indonesian Ministry of Health, 2018). According to a survey carried out by Global Youth Tobacco Survey (GYTS) in 2014 at 72

schools, 32.1% of students have smoked and 20.3% are still smoking. Smoking behavior mostly starts at the age of 12 to 13 years old (WHO, 2014).

Smoking is responsible for over 8 million death a year around the world, with 7 million resulting directly to tobacco usage and 1.2 million from being exposed to second-hand smoke, 90% of lung cancer mortality, 80% of chronic obstructive pulmonary disease (COPD), and increase in health risks such as coronary heart disease, stroke, asthma exacerbation, fertility, bone health, oral problems, cataract, and other types of cancer (CDC, 2020; World Health Organization, 2020). In Indonesia, it was reported that non-infectious disease accounted for over 75.5% of mortality, in which one of its risk factors is smoking. Smoking was a comorbidity in over 88

deaths for every 100,000 people. Using Disability Adjusted Life Years (DALYs), smoking contributed to a number of diseases, mostly toward ischemic heart disease, responsible for about 645 DALYs for every 100,000 people (TCSC-IAKMI, 2020). Smoking was also reported to increase the risk of severe COVID-19 infection by almost two fold (Zhao et al., 2020).

Previous studies at numerous universities in Indonesia suggested that not all college students have good knowledge about tobacco and tobacco hazard. College students in Universitas Indonesia and UIN Syarif Hidayatullah Jakarta have been shown to have good knowledge. However, some studies show that the majority of medical students in Universitas Sumatera Utara and Universitas Andalas have average knowledge about tobacco. This might be because medical students are less active to search for information or there is no special training or curriculum about tobacco (Loren, 2010; Yosantaraputra, Yanwirasti and Abdiana, 2014). A study done in Universitas Syiah Kuala shows that most of its medical students have positive attitudes toward tobacco hazard avoidance and smoking cessation (Mahabbah, 2015). Among smokers, smoking behavior in some college students was found to be high (Azkiyati, 2012; Syarfa, 2015). A high smoking behavior means that a person smokes at least one cigarette per day, smokes frequently, and uses a cigarette containing high amount of nicotine and tar (Azkiyati, 2012).

Smoking behavior can be reduced or even ceased with the help of trained healthcare professionals. Yet, most future healthcare professionals never get any training in smoking cessation counselling (Singh et al., 2003). Approximately 80% of smokers visit primary care physicians annually and, as such, primary care physicians have every opportunity to provide effective smoking cessation treatment as patients generally will be motivated to cease smoking habit (Pipe,

Sorensen and Reid, 2009). As the future healthcare providers or physicians who have to set a good model to the public, medical students should not smoke. Medical students should also have good knowledge about tobacco and an attitude that supports smoking cessation in order to educate the public about smoking hazard.

Consequently, we conducted a study about smoking behavior in medical students at Universitas Sumatera Utara. The aim of this study is to determine about knowledge, attitude toward smoking habit, and smoking behavior among the medical students of USU.

METHODS

This is a descriptive-analytical study with cross-sectional approach, in which data are collected once per subject in a set period of time. This study was conducted from March 2020 to December 2020. Population of this study is current medical students in Universitas Sumatera Utara, Medan city, Indonesia. Subjects in this study are 1st, 2nd, and 3rd year medical students in Universitas Sumatera Utara. As many as 100 currently active medical students were chosen randomly using stratified random sampling. This number was divided evenly into each year of study except 3rd year, which has one subject more than 1st and 2nd year. Inclusion criteria for the subject of this study include currently active 1st, 2nd, and 3rd year medical students in Universitas Sumatera Utara who were willing to fill in the questionnaire. Questionnaires filled incompletely are excluded in this study.

As the COVID-19 pandemic is occurring, Indonesia has enforced “physical distancing” law to prevent the spreading of the infection and, thus, this study was conducted online. Data were collected directly from the questionnaire in the form of Google Form sent through various social media to participants. Questionnaire used in this study was adopted from previous study (Loren, 2010; Mahabbah, 2015; Syarfa,

2015). Participants had to fill informed consent regarding the study before completing the self-administered questionnaires. Demographic data include year of study, smoking status, parental and peer smoking status. Main variables studied are knowledge about tobacco, attitude toward smoking, and smoking behavior among participants. Anonymity is guaranteed for all participants who have filled in the questionnaire

The assessment of knowledge about smoking includes 10 questions about the dangers of smoking, the content of cigarettes, the toxic substances produced by cigarettes and the effect of smoking on health. If the respondent answers 1 question correctly, it equates to a score of 1. Knowledge of smoking is said to be good if the total score is 8-10, moderate if the total score is 4-7 and less if the total score is 3. Attitude is defined as the respondents' response about smoking acceptance, the effects of smoking and respondents' perception toward smokers. It consists of nine questions which are divided into three questions for positive statements and six questions for negative statements. The answers to attitude questions are always, often, rarely and never. In the context of this study, a positive attitude reflects a person's willingness to avoid tobacco hazard and habit. Respondent has a positive attitude toward cigarettes if the total score is ≥ 30.4 and a negative attitude if the total score is ≤ 30.4 . Smoking behavior is defined as the respondent's behavior that describes smoking activities, and consists of 15 questions by choosing one answer always, often, sometimes and never. Respondents are said to have high smoking behavior if the total score is ≥ 40 , moderate if the score is $20 \leq x \leq 40$ and low if the score is ≤ 20 .

Data were processed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive analyses were done by calculating the number and percentage for each categorical variable to summarize the study. Pearson's Chi-Square and Fisher's exact test were used to test the

significance between independent variables (knowledge, attitude, and demographic data) and dependent variable (smoking status); knowledge variable has less than 5 expected count. P value <0.05 is considered significant.

The proposal of this study has been revised, approved, and has received ethical clearance by the Ethical Research Committee of Universitas Sumatera Utara with approval number 307 / KEP / USU / 2020.

RESULT

Table 1. Distribution of demographic characteristic

Characteristics	f	%
Gender		
Male	50	50.0
Female	50	50.0
Smoking Status		
Yes	16	16.0
No	84	84.0

A total of 100 medical students in Universitas Sumatera Utara ranging from 1st year to 3rd year are included in this study. Proportions of male and female medical students in this study were divided equally (50% male and female). Some medical students were found to be smokers (16%) and others (84%) are not (Table 1). Further elaboration on smokers and non-smokers will be shown in Table 3.

Table 2. Distribution of knowledge and attitude

Variables	f	%
Knowledge		
Good	22	22.0
Average	75	75.0
Poor	3	3.0
Attitude		
Positive	63	63.0
Negative	37	37.0

Of the 100 medical students in this study, the majority have an average knowledge regarding tobacco (75%), some

have a good knowledge (22%), and a small number of students have poor knowledge (3%). Most students have attitude that tends to avoid tobacco smoking and preventing tobacco hazard (63%) while others (37%) seem to be either fine about smoking behavior and its hazards or apathetic toward it (table 2).

Among the 16 smokers, most seem to have a high smoking behavior (37.5%)

and the rest have an average (31.25%) or low (31.25%) smoking behavior (Table 3).

Table 3. Smoking behavior of medical students

Smoking behavior	f	%
High	6	37.5
Average	5	31.25
Low	5	31.25

Table 4. Bivariate analysis of dependent and independent variables with Chi-Square test

Variables	Smoking Status				P value
	Smoker		Non - smoker		
	f	%	f	%	
Gender					
Male	12	12.0	38	38.0	0.029
Female	4	4.0	46	46.0	
Smoking Parent					
Yes	4	4.0	28	28.0	0.513
No	12	12.0	56	56.0	
Smoking Peer					
Yes	13	13.0	19	19.0	0.000
No	3	3.0	65	65.0	
Knowledge					
Good	3	3.0	19	19.0	1.000
Average - Poor	13	13.0	65	65.0	
Attitude					
Positive	4	4.0	28	28.0	0.001
Negative	12	12.0	56	56.0	

Of 100 students, 12 males (12%) and four females (4%) are smokers. Most smokers have an average knowledge about tobacco (13%) but the rest have a good knowledge (3%). Some smokers have positive attitude toward tobacco avoidance even though they smoke (4%) and others have no qualms about smoking behavior (12%).

Most smokers claim that their parents don't smoke (12%) while some report that they have at least one parent who smokes (4%) and regarding smoking close friends or colleagues, most smokers report that they have a close friend who smokes

(13%) and some claim to not have a smoking close friend (3%).

Bivariate analysis using Pearson's Chi-Square test shows statistically significant association between attitude toward smoking, gender, and smoking peer with students' smoking status ($p=0.001$; $p=0.029$; $p=0.000$). However, there is no statistically significant association between parental smoking and students' smoking status ($p=0.513$). Bivariate analysis of knowledge about tobacco and students' smoking status using Fisher's exact test shows no statistically significant association ($p=1,000$). Group in knowledge

variable is simplified to Good and Average - Poor in order to meet the requirement for the test.

DISCUSSION

Demographic characteristics

Results in this study shows that the prevalence of smoking among medical students in Universitas Sumatera Utara is 16%. This is more than the reported number by previous study in 2009 suggesting that the prevalence was 9.2% (Loren, 2010). Results also show that male smokers are found to be more dominant than female smokers and there is a correlation between gender and smoking status. This is consistent with a finding in UIN Syarif Hidayatullah Jakarta, in which the study suggested that male adolescents tend to smoke thirty times more than female. Female smokers were less prominent because mostly females avoid smoking behavior as it contradicts their culture and value (Syarfa, 2015). However, the number of female smokers might increase because of changes in lifestyle in which females wish to appear more modern and, as such, have adopted smoking behavior and if such action were to receive support and was done with another smoking peer, smoking intensity might increase (Barraclough, 1999; Sartika, Indrawati and Sawitri, 2009). Females also smoked to cope with negative feelings, when having troubles with surrounding people, getting bad grades, or under stress (Akbar, Istiqomah and Afriandi, 2019).

A study suggested that four factors were found to influence a person's smoking behavior such as peer pressure, parents, advertisements, and personality. Family is the closest environment to students and behaviors could be influenced toward each other. Smokers tend to have peers who also smoke and, with conformity theory, it is suggested that one would follow a person's opinion, habit, and behavior to feel comfort in a group (Fuadah, 2011; Wibowo, 2018). In this study, smoking peer and parent are reported by both smokers and non –

smokers and results find that smoking peer has significant association with smoking status, but not smoking parent, which corresponds and also contradicts some studies' result (Abu-elenin, Omar Atalla and El-Salamy, 2017). Awareness toward smoking hazard is easily masked by these social factors (Singh et al., 2003). Imitating others, gaining pleasure from the habit, or filling leisure time could also be reasons students smoke (Abdalla et al., 2011).

Knowledge regarding tobacco

Medical students should be responsible by having good knowledge regarding tobacco in order to fix tobacco health-related problems (Mahabbah, 2015). Majority of knowledge about tobacco among medical students is average. This study's finding corresponds with previous studies, which also suggested most medical students' knowledge category is average regarding tobacco. This might be because the lack of training or lectures regarding tobacco, nicotine, and its hazard in conjunction with inactivity of medical students in information seeking (Loren, 2010; Yosantaraputra, Yanwirasti and Abdiana, 2014). Individuals with good knowledge about tobacco tend to avoid smoking behavior (Maseda, Suba and Wongkar, 2013).

In this study, most smokers have an average knowledge, but some have a good knowledge regarding tobacco, although, this study does not find significant association between knowledge and students' smoking status. Smokers have a tendency to underestimate smoking-related morbidity and mortality as a study found that smokers gave less appropriate answers about smoking-related health issues than non-smokers (Kusma et al., 2010). Studies also found that medical education alone will not increase awareness about tobacco hazard and cease smoking behavior, and even if medical students possess a good knowledge about tobacco hazard, most still continue smoking because of stress and peer pressure (Al-Haqwi, Tamim and Asery,

2010; Chkhaidze et al., 2013). Insufficient knowledge about tobacco associated health risk will lead patients to miss chances to cease smoking habit due to unknowledgeable physician (Jradi and Al-Shehri, 2014).

Attitude toward smoking habit

Positive attitude in this study reflects a person's willingness to avoid tobacco hazard and habit. In this study, results show most medical students have positive attitude and find that there is a significant association between attitude and students' smoking status, which corresponds with a study suggesting students are aware of tobacco hazard toward health and economy (Mahabbah, 2015). Studies found that most medical students support smoking cessation with counselling, should be a role model for public by not smoking, and smoking cessation counselling is a healthcare professional's responsibility. Smokers, on the contrary, tend to not show an attitude that supports smoking cessation and have a positive attitude toward supporting smoking habit to their patients (Ferrante et al., 2013; Salgado et al., 2017). However, a study found that most former smokers agree that smoking is hazardous to health and decided to quit smoking in concern of harming others, setting an example for patients and society, or money saving. Most students were also found to support sharing responsibility in persuading their patients to cease smoking and also agree that physicians should receive special courses regarding smoking cessation counselling (Shalaby and Soliman, 2019).

Smokers were less likely to stop smoking either because they believe they are more successful in advising patients to cease smoking habit considering they have first-hand experience, or they are less likely to provide smoking cessation counselling to their patients. Not only did smoking affect attitude toward smoking cessation, smokers were also less likely to believe that tobacco use could influence a physician's care,

which contradicts a lot of studies. This, with the absence of training, could lead to a lack of investigating smoking history (Armstrong et al., 2017).

Smoking behavior

Smoking habit, if developed during adolescence, will continue to drive during their young adult ages, with the amount of smoking and related consequences also increasing (Jalilian et al., 2015). As a future physician and healthcare worker, medical students should avoid participating in any smoking activities. Smoking behavior among students who smoke in this study is mostly found to be high. A high smoking behavior can be influenced by feeling of addiction from smoking (Azkiyati, 2012). The result of this study corresponds with a study which suggested that health students should not have a high smoking behavior as they are a future physician and healthcare worker (Syarfa, 2015). Yet, some health students seem to be having difficulty in ceasing smoking habit because of life and academic pressure, experiencing headache, and unable to concentrate while studying (Elamin et al., 2013). Identical results were also suggested by a study that found the majority of smoking medical students claim to start smoking as a means to relieve stress and mere entertainment (Abu-elenin, Omar Atalla and El-Salamy, 2017). In order to cease smoking behavior among medical students, not only does awareness regarding tobacco hazard need to be raised, but also the supportive attitude from surrounding people (Elamin et al., 2013).

Smoking behavior among healthcare providers could be the effect of occupational stress and old cultural norms, which used to accept smoking habit and associated it with a certain status symbol, thus hindering the ability to counsel patients about smoking cessation (Juranić et al., 2017). A study involving nurses, physician, and healthcare staff found that most of the subjects were smokers and did not think a health-related occupation should be a role model and some healthcare workers even

claimed to smoke in front of their patients (Masia et al., 2006; Zinonos et al., 2016). The same results were also yielded in a study involving primary care physicians as it was suggested that non-smoker physicians are more likely to provide advice regarding smoking cessation to patients than smoking physicians (Al-Hagabani et al., 2021). Most healthcare workers wish to cease their smoking habit because it could affect their smoking cessation counselling and most patients will try to cease smoking behavior with the help of healthcare workers, even those who have low motivation in quitting (Zinonos et al., 2016).

Based on the results of this study, which found that smoking behavior was still high in Universitas Sumatera Utara medical students, and most of the knowledge was still at an average level and there was still a negative attitude toward smoking, then several things must be done to overcome and improve this. Medical students who smoke need to undergo smoking cessation counselling in order to reduce or cease their smoking habit as it could affect their practice. A special curriculum regarding tobacco and nicotine hazard with training on how to educate and help patients to cease smoking behavior and a regulation in preventing smoking activities should be implemented in the Faculty of Medicine.

CONCLUSIONS

The prevalence of smoking behavior among medical students in Universitas Sumatera Utara, although not too high (16%), is a matter of concern considering the students are future physicians who have a role in educating patients to cease smoking behavior and have insufficient knowledge regarding tobacco with only 22% of the medical students having good knowledge; this might impact the outcome of a patient in ceasing their smoking habit. Fortunately, most students showed positive attitude toward smoking habit avoidance and supporting

smoking cessation. With this study's finding of a significant association between students' smoking status with gender, smoking peer, and attitude toward smoking, regulations need to be enforced and awareness needs to be raised in order to prevent students from adopting a smoking habit.

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LOCOMOTOR DISABILITY AMONG ADULT POPULATION OF A NORTH INDIAN DISTRICT: A CROSS SECTIONAL STUDY

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ABSTRACT:

Introduction: Disability, which has been deemed as a significant public health problem in our country, in any form, be it correctable or not, tends to hamper the day to day life of the affected person. It affects their personal as well as professional life to a great extent, and creates a lack of confidence and difficulty in social interactions. To assess the burden of locomotor disability, its socio-demographic correlates, and suggest measures to improve the life of people with disability. **Methods:** It was a cross-sectional study, conducted in areas under the rural and urban health training centers, using a pretested and validated questionnaire along with appropriate examination of the involved system. A total of 900 individuals were included. The study duration was July 2017 to June 2018. The collected data were analyzed using SPSS 20.0. **Results:** The total prevalence of disability (of any type) contributed to 13.6% while locomotor disability was found to be 4.44% in the study population. Significant association of locomotor disability was observed with age, gender, marital status and occupation ($p < 0.05$). **Conclusion:** Availability and accessibility of rehabilitation centers at the peripheral areas, along with creating community awareness towards it, may prove to be a step in the right direction to alleviate the discomfort of the people living with disability.

Keywords: disability, locomotor, adults, rehabilitation, people with disability

INTRODUCTION

Disability is any limitation or inability, to execute a desired activity, in a way or within the range, considered normal for the human beings, resulting from impairment. In other words, disability is loss of functional capacity due to impairment of any body part while impairment affects the physical aspects of health. Being handicapped on the other hand takes into

account social and cultural effects of either impairment or disability (Barbotte et al., 2001). The International Classification of Functioning, Disability and Health developed by the WHO in 2000, considers health and disability in a continuum and that every human being can experience some degree of disability during his lifetime (WHO, 2002). A Multi-Country Survey Study during 2000 and 2001 and the World Health Survey Program in 2002 and 2003, have used ICF to assess

health status of the general population in a total of seventy-one countries. Bedirhan Üstün *et al.*, 2001).

As per the worldwide statistics on disability, third world countries like India are facing a significant public health concern with the prevailing estimates of disability in the country. It also typically exhibits iceberg phenomenon of disease as mild to moderate degrees of disability, generally, remain unrecognized by the healthcare delivery system at initial levels. The World Health Survey, reported, that, in adult population of age 18 years and above, the average disability prevalence was 15.6% (WHO, 2012). The Global Burden of Disease Survey also estimated 190 million (3.8%) people with severe disability. Over a billion people (about 15% of the world's population), including children, were estimated to be living with disability. In the light of the above facts, the WHO has taken a note of the problem and has included disability, as a concern for the Sustainable Development Goals (SDGs) to be achieved by 2030. The SDG 10 also entails emphasizing upon the social, economic and political inclusion of persons with disabilities (Griggs *et al.*, 2013).

There are few studies which have shown the prevalence of disability among a wider age group comprising of old as well as young adults. Most of the studies, included in literature have been conducted in older age groups (>50years) only and also fewer studies have endeavored to find out an association, if any, between individual disabilities and the socio-demographic profile of the population. The present study thus, aimed to estimate the prevalence of locomotor disability in the adult population and to document the socio-demographic correlates of locomotor disability.

METHODS

This community-based cross-sectional study was conducted in the field

practice areas of the urban and rural health centers, Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh. The study was done among the adult population of 20 to 60 years of age, registered under Urban Health Training Center (UHTC) and Rural Health Training Center (RHTC). RHTC and UHTC, respectively, provide health services to six villages and four urban areas. Period of this study was from July 2017 to June 2018. Households were taken as sampling units while individuals were taken as study units.

Sample size for the study was calculated on the basis of disability prevalence rate of 15.6%, reported by the WHO (WHO, 2012), Using a precision of 5% and 95% confidence interval, with a prevalence of 15.6% and relative error of 16%, the sample size was calculated to be 816. Along with non-response rate of 10%, the final sample size was calculated to be 898, rounded off to 900. To draw sample size, systematic random sampling with probability proportionate to size (PPS) was used. Number of families were recruited after taking into account the fact that 50% population belongs to the desired age group (*Aligarh District Population Census 2011 Uttar Pradesh literacy sex ratio and density.*, 2011). Every k^{th} household was visited and all the individuals between 20 to 60 years of age, willing to participate and had given written consent, were interviewed and screened by a pre-tested questionnaire, and examined afterwards.

Questionnaire had patient profile (baseline information regarding age, sex, religion, educational status, marital status, occupation, type of family and social class (Modified B.G. Prasad), and detailed history. Examination assessment of the set disabilities was done using appropriate clinical instruments suitably and recorded in pretested and pre-validated questionnaire. A pilot study was done on 10% of sample size and required changes were made in the

questionnaire as per the response elicited, to make it more comprehensible.

Definitions

Disability: A person with restrictions or lack of abilities to perform an activity in the manner or within the range considered normal for a human being was treated as having disability. Examples of disabilities include difficulty seeing, speaking or hearing; difficulty moving or climbing stairs; difficulty grasping, reaching, bathing, eating, toileting (United Nations, 2013).

Locomotor disability is defined as a person with either loss or absence or inactivity of whole or part of hand or leg or both due to amputation, paralysis, deformity or dysfunction of joints which affected his/her "normal ability to move self or objects" or with physical deformities in the body (other than limbs), regardless of whether the same caused loss or lack of normal movement of body such as, hunchback, deformed spine, etc. (MOSPI, 2012). Dwarfs and persons with stiff neck of permanent nature who generally did not have difficulty in the normal movement of body and limbs were also treated as disabled.

Data were entered and managed in SPSS-20 (Statistical Package of Social Science). For descriptive statistics: frequency, percentage, proportion, mean and standard deviation, graphs and cross tabs were used to present study results. Qualitative data were further analyzed utilizing statistical tests of significance, viz Chi-square test, Fisher's exact test along with further quantitative analysis using Student t-Test and computation of frequency, mean, median and proportion along with standard deviation using the statistical software. p value <0.05 was considered significant.

The proposal of this study has been revised, approved, and has received ethical clearance by the Institutional Ethics Committee of Faculty of Medicine, AMU, Aligarh with approval number 651 / FM/ 17.7.2017. Informed verbal consent was taken from each subject before interview. The nature and purpose of the survey were explained to them and confidentiality of all the participants was assured. Interviews were conducted in a non-hostile and non-judgmental manner. Local cultural values and ideas were respected. Appropriate health education and personalized counseling were provided to all the respondents. Prompt referral was also employed if any participant was found to be afflicted with serious disability and warranted specialist attention.

RESULTS

Profile of study population

The major proportion of the study population was in the 20-30 years age group (42.8%) while least number of individuals (13%) were of the 51-60 years age group. Females were in the majority in all the age groups. Around 80.3% of the subjects were married and it was seen that most of the widowed/divorced participants in this study were females, while both sexes were found to have equal distribution in never married population. Most of the study participants were illiterate (45.4%) and only 21.3% and 18.7% of subjects completed their primary and high school education, respectively. At the time of study, a large proportion (68.8%) of the study population was found to be unemployed/dependent and of them mostly were females (47.1%), who were supporting their families as homemakers. Almost half of the study population belonged to the socioeconomic class IV (50.1%)(Table 1).

Table 1. Socio-demographic profile of study population.

Characteristic	Frequency (N)	Percentage (%)
Age group (in years)		
20-30	385	42.7
31-40	230	25.6
41-50	168	18.7
51-60	117	13.0
Gender		
Male	344	38.2
Female	556	61.8
Residence		
Urban	372	41.3
Rural	528	58.7
Marital status		
Married	723	80.4
Unmarried	130	14.4
Widowed/ divorced	47	5.2
Occupation		
Housewife	424	47.2
Student	57	6.3
Employed	281	31.2
Unemployed	138	15.3
Socioeconomic class (Modified B.G. Prasad)		
I	43	4.8
II	136	15.1
III	202	22.4
IV	451	50.1
V	68	7.6
Total	900	100.0

*Modified BG Prasad classification 2016

Prevalence and Causes of Locomotor Disability

Prevalence of locomotor disability in the present study was found to be 4.4% (40/900) against any type of disability, which was encountered in 13.6% (122/900) of the study population. Among the important causes of locomotor disability, poliomyelitis or its sequelae accounted for the foremost etiology (27.5%) in the study population. Age

related degenerative conditions like osteoarthritis, kyphoscoliosis, osteoporosis and osteomalacia, etc., were detected in 22.5% of the population. Etiologies like traumatic loss of limb, post traumatic paralysis, limb loss due to denervation, others like post-injection palsy and stroke leading to different grades of limb paralysis and last but not the least congenital causes accounted for other prevalent causes of locomotor disability in that order (Figure 1).

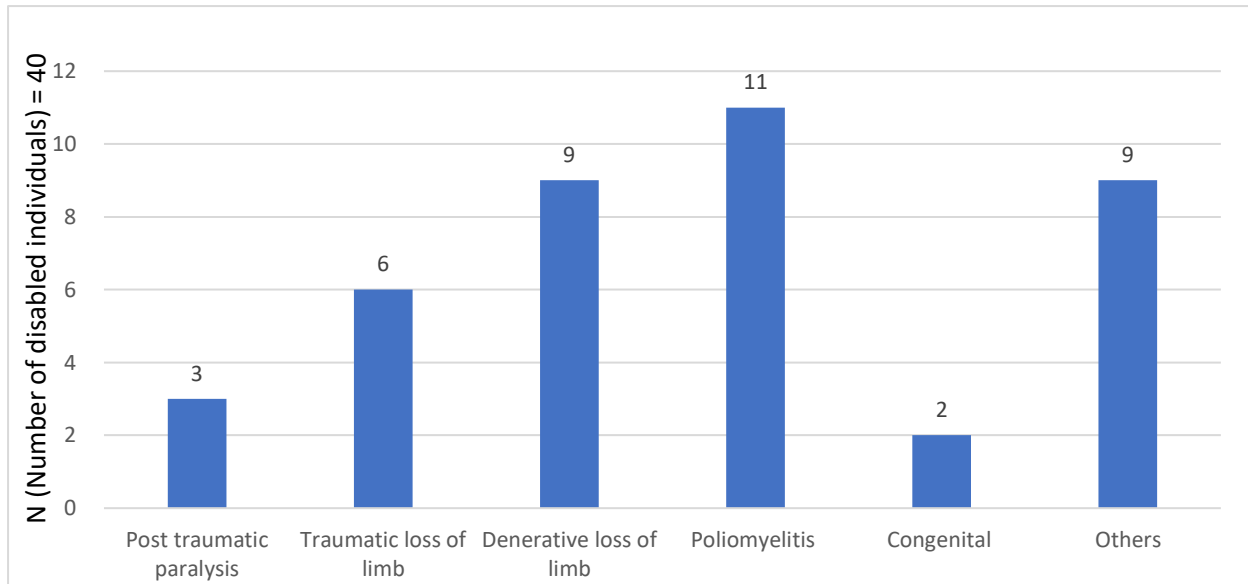


Figure 1. Causes of locomotor disability in the study population

One or both lower limbs were affected in 37.5% of the individuals with locomotor disability. One upper limb alone was disabled in 12.5% individuals. One upper and one lower limb were involved by disability in 10% of those having locomotor disability. Activities of daily living are bound to be adversely affected in the wake of any locomotor disability(ies). Of these, transfer of

the afflicted individual from one decubitus to another or from their residence to treatment centre was most adversely affected. Self-dressing, use of toilet and bathing were similarly impacted to cause inconvenience in that order. Bathing and continence issues, though less commonly found to be affected in the study, were also important limitations in their own right (Table 2).

Table 2.Extent of locomotor disability and affected activities in the study population

Extent	Frequency (n/N)	Percentage (%)
One upper limb	5/40	12.5
One upper and one lower limb	4/40	10.0
One lower limb	15/40	37.5
Both lower limb	15/40	37.5
All four limbs	1/40	2.5
Activities affected*		
Feeding	8/40	20.0
Bathing	21/40	52.5
Transfer	30/40	75.0
Dressing	28/40	70.0
Toilet	20/40	50.0
Continence	6/40	15.0

*Multiple activities were affected in the individuals

Of the majority of the disabilities studied, 52.5% were non-progressive

(traumatic loss of limb and poliomyelitis) in their natural history of disease. However,

32.5% of the afflicted population had a progressively deteriorating course of illness (degenerative). Six out of 40 affected individuals were found to have an improving course in their illnesses with or without treatment (Table 3). In the context of health seeking behavior, in the form of treatment

sought for the type(s) of disability, medication was employed as the sole means of treatment in 60% (n=22) locomotor disabled patients followed by surgery in 12 study participants. However, four individuals could not seek or afford any modality of treatment (Table 3).

Table 3. Course of illness causing existing locomotor disability

Illness	Improving	Non- progressive	Deteriorating
Congenital	0	2	0
Post-traumatic paralysis	0	3	0
Traumatic loss of limb	1	4	1
Degenerative (arthritis, Kyphoscoliosis, etc.)	0	0	9
Poliomyelitis	0	11	0
Post-injection palsy	0	1	1
Cardiovascular accident leading to paralysis	1	0	0
Others	4	1	1
Total (N=40)	6	22	12

On a positive import, the families of the afflicted individuals with locomotor disability in the study population were largely supportive as far as monetary keeping of the special arrangements for the affected ones was concerned. Almost a third of the afflicted population had otherwise supportive caregivers, and they were found to lend mental, financial and materialistic support to their disabled family members. Despite the fact that that depression, apathy, self-pity and

mood instability were also common in these individuals (n=14), an encouraging 50% individuals were finding solace in appropriate recreational and physical activities in concordance with the extent of disability. However, a pretty low number of disabled study participants were found to be benefited by government aid, in the form of pension for the indexed individual (n=2) and also locomotor aids were afforded by a very small proportion as well (Table 4).

Table 4. Social, financial and family support determinants among population afflicted with locomotor disability

Determinants	Present N(%)	Absent N(%)	Total N(%)
Depression or mood instability due to illness	14(35.0)	26(65.0)	40(100)
Arrangements made by family	37(92.5)	3(7.5)	40(100)
Monetary support from family members	36(90.0)	4(10.0)	40(100)

Determinants	Present N(%)	Absent N(%)	Total N(%)
Supportive attitude of caregiver toward disabled person	37(92.5)	3(7.5)	40(100)
Self-perception of illness	33(82.5)	7(17.5)	40(100)
Involved in recreational and physical activities	20(50.0)	20(50.0)	40(100)
Use of government aid or pension	2(5.0)	38(95.0)	40(100)
Use of locomotor aids	8(20.0)	32(80.0)	40(100)

Locomotor disability appeared to be significantly more in the oldest age group of the study population ($p < 0.001$) and also among males compared to females ($p < 0.05$). Among urban and rural populations, the proportions of locomotor disability were comparable at 4.8 and 4.2% respectively

($p > 0.05$). Widowed/divorced individuals were found to be significantly more disabled at 12.8% followed by unmarried and married individuals ($p < 0.05$). Locomotor disability was also found to be largely associated with unemployment ($p < 0.001$) and lower socioeconomic class as well ($p < 0.05$) (Table 5).

Table 5. Association of locomotor disability with socio-demographic variables

Variables	Locomotor disability (N= 40)	
	Present N(%)	Absent N (%)
Age in years		
21-30	11 (2.9)	374 (97.1)
31-40	9 (3.9)	221 (96.1)
41-50	6 (3.6)	162 (76.4)
51-60	14 (12)	103 (88)
$\chi^2 = 18.323$, $df=3$, $p < 0.001$		
Gender		
Male	23 (6.7)	221(93.3)
Female	17 (3.1)	539(96.9)
$\chi^2 = 6.588$, $df=1$, $p = 0.01$		
Residence		
Urban	18(4.8)	354(95.2)
Rural	22 (4.2)	506 (95.8)
$\chi^2 = 0.232$., $df=1$, $p = 0.630$		
Marital status		
Married	24(3.3)	699(96.7)
Unmarried	10(7.7)	120(92.3)
Widowed/ divorced	6(12.8)	41(87.2)
$\chi^2 = 11.047$, $df=2$, $p = 0.001$		
Occupation		

Variables	Locomotor disability (N= 40)	
	Present N(%)	Absent N (%)
Student	2 (3.5)	55 (96.5)
Housewife	11 (2.6)	413 (97.4)
Employed	8 (2.8)	273 (97.2)
Unemployed	19 (13.8)	119 (86.2)
$\chi^2= 33.471, df=3, p<0.001$		
Socioeconomic status (Modified BG Prasad classification 2016)		
I	1 (2.3)	42 (97.7)
II	7 (5.1)	129 (94.9)
III	4 (2)	198 (96)
IV	20 (4.4)	431 (95.6)
V	8 (11.8)	60 (88.2)
$\chi^2= 12.081, df=4, p= 0.017$		

DISCUSSION

In the present study, the prevalence of locomotor disability was observed to be 4.4%. In contrast to our study, others reported locomotor disability prevalence of 1.7% in a large sample population of 4000 individuals (Suganthi and Kandaswamy, 2015) while a prevalence of 11.3% was reported by Ahmad et al. (2017) in their National Health and Morbidity survey.(A) However, comparable to our study, Padhyegurjar and Padhyegurjar (2011) reported a prevalence of 5.59% in urban slums of Mumbai.

As far as finding the causes of locomotor disability is concerned, poliomyelitis or its sequelae accounted for the foremost etiology (27.5%) among the disabled individuals and age-related degenerative conditions like osteoarthritis, kyphoscoliosis, osteoporosis and osteomalacia, etc., accounted for another 22.5% of disability. Suganthi and Kandaswamy (2015), in their cross-sectional study, found congenital, residual paralysis (18.9%) and stroke (16.2%) arthritis (degenerative disease) accounted for the leading causes of locomotor disability while the National Sample Survey Organization reported polio as the leading cause of

locomotor disability followed by injuries other than burns (NSSO, 2003). Another study conducted back in 2002, also reported poliomyelitis as the leading cause of disability (Kar, 2002). However, the pattern of locomotor disability found in our study was to an extent disparate from what other researchers observed in rural areas of Burdwan (Kar, 2002), where one lower limb and both lower limbs were afflicted by disability by 53.3% and 14.4%, respectively. The could be due to difference, in their employed operational definitions, and in other determinants like variations in health seeking behavior and government aid facilities could also account for the difference. Also, this study has been conducted in the areas registered under the rural and urban health centers, so, their healthcare needs have been catered to the best possible extent for several years.

Locomotor disability was comparatively more in the age group 51 years and above (12%), and almost comparable in the age groups of 31-40 and 41-50 years. The youngest age group (20-30 years) in the study population was the least afflicted one. Similar pattern was observed in other study where disability prevalence per 1000 was highest in same age group as in our study (Suganthi and

Kandaswamy, 2015). Borker et al. (2008) and Padhyegurjar and Padhyegurjar (2011) also reported similar substantial association between age and locomotor disability. It's a well-known fact that musculoskeletal weakness as well as osteoporosis and other degenerative conditions associated with old age may favor the higher prevalence of locomotor disability in older age groups as well as the association with age that surfaced in the present study.

In this study, males were found to be affected more than females, i.e. 3.1%, with the concerned disability, and the difference proved to be significant as well. Likewise, other researchers also observed higher prevalence of locomotor disability in males as compared to females ($p < 0.05$) ((Osman and Rampal, 1989; Suganthi and Kandaswamy, 2015)). However, higher proportion of disability in females (71.22%) was reported by Padhyegurjar and Padhyegurjar (2011). Prevalence of locomotor disability in our study was found to be higher in widowed/divorced individuals (12.8%) followed by that among unmarried (7.7%) and married individuals (3.3%).

Borker et al. (2008) found a significant association between occupation and prevalence of disability. Likewise, this study also found significant association of the concerned disability with nature of employment, as a majority of the individuals with locomotor disability were found to be unemployed when included in the study. Similar association was also reported by de Andrade et al. (2015) in their study. In the lowest socioeconomic class, the locomotor disability was found to be significantly higher (11.8%). Similar observations were reported by other researchers, where they found parallel association between the two variables (Padhyegurjar and Padhyegurjar, 2011). As far as difference between urban and rural populations is concerned, the proportions of locomotor disability were comparable at 4.8% and 4.2%, respectively. ($p > 0.05$).

CONCLUSION

From the study, it can be concluded that disability is a significant health concern in the study population. The majority of the causes of disability in all physical domains were potentially preventable and, therefore, it's high time to call for long and short-term targeted interventions. Education, employment and overall socioeconomic status of the community were important determinants of disability and, therefore, need to be taken care of appropriately. As the older population is more at risk, healthcare interventions and programs should address the felt needs as priority. Factors that lead to poor awareness and decreased healthcare utilization, as we found in our study population, should be probed with wider dimensions. We also need more robust attempts to study the efficacy of community-based rehabilitation programs, with focus on felt and received needs. Individuals with multiple disabilities, require multidisciplinary care and provision of all essentially desired services at one point, in order to achieve holistic healthcare.

Community awareness regarding avoidable disability and also about the available government schemes, benefits and programs for the disabled population, should be increased. Measures to ensure vocational rehabilitation for the disabled, suited to individual capacity, should be instituted at different government level health facilities with strong political will. And last, more studies should be conducted in future to assess the extent and impact of disability upon the individuals and their families.

Limitations

The study cannot be taken as completely representative of the urban and rural areas of Aligarh district as the sample size was relatively small. Also, ours being a retrospective study, the complete extent of

disability in an individual could not be assessed, especially for etiologies where the normal history was progressive. Important variables like the effect of disability on families and response of affected families to such disability could not be studied for time and logistic constraints. Mental health, which is an important component of disability, could not be studied.

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IMPLEMENTATION OF AN EXCLUSIVE BREASTFEEDING POLICY IN WONOGIRI REGENCY

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ABSTRACT

Introduction: Breastfeeding is the best intake to fulfill nutrition of babies aged 0-6 months. In Wonogiri Regency, exclusive breastfeeding achievement in 2017 is 53.62% and 25 out of 34 public health centers haven't reached the target yet. **Method:** This research was descriptive research type with observational approach and cross-sectional design. Sample was 34 public health centers in Wonogiri Regency, with nutritionist, midwives and health cadres from each public health centers as respondents. The data were collected using interview and questionnaire techniques, and correlation analysis performed using the contingent coefficient method. **Result:** show that communication factors showed good result for respondent's knowledge, consistency in obtaining socialization and transmission to carry out further socialization. Resource factors show that availability of nutrition staff isn't sufficient and funds lack for activities related to exclusive breastfeeding. On disposition factors, respondents disagree with the gift provided from the formula milk distributor because it can inhibit achievement of exclusive breastfeeding purpose. And many public health centers still don't have exclusive breastfeeding SOP. **Conclusion:** It can be concluded that training, availability of facilities and infrastructures in lactation room and number of staff positively affect target achievement of exclusive breastfeeding. The effort that can be done is by giving counselling of breastfeeding to workers and healthcare staff, fulfillment of facilities and infrastructure of lactation room to support exclusive breastfeeding, making SOP related to breastfeeding for public health centers.

Keywords: Exclusive Breastfeeding, Policy Implementation, Public Health Center

INTRODUCTION

The infant mortality rate (IMR) is an indicator of public health degree. The factor that most influences the infant mortality rate is the nutritional factor, so nutrition needs to be given serious attention, especially the best nutrition for babies being breast milk (ASI). Breast milk is important for optimal baby development, both physical and intelligence. Consuming exclusive breastfeeding at 0-6 months will also prevent mental problems when the child is 3-4 years old by 76.2% (Setyarini, Mexitalia and Margawati, 2016). Because of its significant benefits, exclusive breastfeeding requires the community's attention, especially breastfeeding mothers, to be successfully carried out. The most effective intervention in reducing the infant mortality rate is exclusively breastfeeding the baby (Mufdlilah, 2017).

The movement to provide exclusive breastfeeding in Indonesia is still minimal

even though the legal principles related to the exclusive breastfeeding program policy have been regulated since 1979 in Law Number 4 concerning child welfare which was then clarified in Government Regulation Number 33 of 2012 concerning exclusive breastfeeding (Zainafree, Widanti and Wahyati, 2016), As happened in 34 public health centers in Wonogiri Regency, the achievement of exclusive breastfeeding in 2017 was 53.62%. This achievement still did not meet the target set of 66%. This achievement has decreased over year (Central Bureau of Statistics, 2018). In Wonogiri Regency, the health center is the executive of the exclusive breastfeeding program under the direction of the Health Office with a policy based on the Wonogiri Regent Regulation No. 12 of 2012 on increasing breastfeeding in Wonogiri Regency. Even though it has a written policy, data on the attainment of exclusive breastfeeding in Wonogiri Regency have not met the target.

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Government Regulation No. 33 of 2012 on Exclusive Breastfeeding explains that to support the success of the Exclusive Breastfeeding program, things that must be done include regulating early breastfeeding initiation (IMD), health workers or health service providers carrying out joint care, prohibiting formula milk as a substitute for breastfeeding and procuring a lactation room (Secretariat General of the Ministry of Health of the Republic of Indonesia, 2012). From research (Andriani, Ainy and Destriatania, 2016) which conducted an analysis of implementing the exclusive breastfeeding program at the Lumpatan Community Health Center in Musi Regency, the success of the exclusive breastfeeding program was influenced by several factors, including resources, budget, infrastructure, socialization methods used, intervention situations and activities.

The success of the exclusive breastfeeding program does not escape the role of stakeholders. In research (Parji, 2017), the synergy between stakeholders in the aspects of communication effectiveness, trust, awareness of contribution and equality influenced the success of the exclusive breastfeeding program. The implementation of the exclusive breastfeeding policy in Rungkut Subdistrict, Surabaya is also carried out based on Government Regulation No. 33 of 2012. Implementation of exclusive breastfeeding regulations as Government support for mothers also is not optimal as exclusive breastfeeding is a disposition to each region, although these regulations are not enforced by all regions. The absence of strict sanctions from the central government to local governments and public facility providers who do not carry out regulations related to exclusive breastfeeding, makes the exclusive breastfeeding counseling program considered less intensive to do (Safitri and Puspitasari, 2018). In regions and agencies, it needs written policies related to exclusive breastfeeding. The existence of a

written policy will help the program to be planned properly and run optimally.

At the Bukittinggi City Health Center, one obstacle in implementing the exclusive breastfeeding program is the absence of a policy from the City Government and the lack of cross-sectoral and cross-programmatic issues. Because of the lack of a policy, the allocation of funding and facilities for exclusive breastfeeding activities at Health Center is not well-programmed and has led to exclusive breastfeeding, which does not fulfill government objectives (Ezafitria, 2019). Not only in health agencies, at PT Royal Korindah, Purbalingga Regency, implementing the breastfeeding policy for female workers is still in the moderate category (54.2%) because the company does not have internal regulations and supervision from related agencies has not been implemented optimally (Andriani, Ainy and Destriatania, 2016).

The purpose of this study was to analyze communication factors, resource factors, disposition factors and organizational structure factors on implementing exclusive breastfeeding policies, which will then analyze the implementation of exclusive breastfeeding policies that have been carried out at public health centers in Wonogiri Regency. Here, it relates to the coverage of exclusive breastfeeding, which is an indicator of the success of the nutrition program.

METHODS

This research is a descriptive study with an observational approach using a cross-sectional design. The population in this study were all public health centers in Wonogiri Regency, as many as 34. This research was conducted from February to April 2019 in Wonogiri Regency, Central Java.

Primary data collection, namely communication factors, resource factors, disposition factors and SOP presence factors, was carried out by interview with

questionnaire techniques, with respondents comprising nutrition officers, midwives and health cadres who were each selected as a representative of the sample. Meanwhile, secondary data were obtained from documents from the Wonogiri Regency Health Office. Data processing proceeded through the editing, coding, scoring and entry stages and were then analyzed descriptively.

The initial stage of the research carried out was to identify communication factors, resource factors, disposition factors and organizational structure factors at the public health centers' exclusive breastfeeding policies implementation. Then calculations were performed with the contingency coefficient method to measure and analyze the correlation between the two research factor variables of the nominal data type. The results of the contingency coefficient will then be used to analyze the implementation of the exclusive breastfeeding policy in Wonogiri Regency. This study has passed the ethical clearance with No: 93/EA/KEPK/2019.

RESULT

The health administration of Wonogiri Regency comprises 34 public health centers; 29 of them are outpatient public health centers and five are inpatient health centers. In all health centers there are 225 midwives. There are 24 nutrition staff in all health centers, while the remaining 10 health centers are midwives for the nutrition program. There are 10,754 health personnel, 10,041 of whom are active cadres at all health centers in Wonogiri Regency. The results obtained are:

Communication

In the dimension of clarity of policies related to implementing exclusive breastfeeding, namely knowledge of exclusive breastfeeding policies, on average respondents knew about the clarity of the policies of Law No. 36 of 2009,

Minister of Health Regulation No. 15 of 2013, Government Regulation No. 33 of 2012, Governor Regulation of Central Java No. 17 of 2016 and Regent Regulation Wonogiri No 12 of 2012. Regarding Government Regulation No. 33 of 2012, nutrition officers have an average of sufficient knowledge of 15 people (44%), midwives have an average of good knowledge of 19 people (56%) and health cadres have an average knowledge of sufficient 17 people (50%).

As for the consistency in the implementation of Government Regulation No. 33 of 2012, most of the respondents had received socialization, namely 91 people (89.2%) with the source of socialization from the District Health Office, specifically the health center for nutrition officers, midwives and health cadres, then Family Care Welfare also carried out socialization to health cadres. And for Wonogiri Regent Regulation No 12 of 2012, most of the respondents had received socialization, namely 84 respondents (82.3%) with the source of socialization from the health center for nutrition officers, midwives and health cadres. Besides that, health cadres also get policy outreach from the Empowerment of Family Welfare (EFW), and the Wonogiri Regency Health Office also provides outreach to nutrition officers and midwives.

In terms of transmission, 91 respondents (89.2%) had carried out further socialization for Government Regulation 33/2012 with the target of socialization being midwives, cadres, community groups and patients (pregnant women and women giving birth). As for the Wonogiri Regent Regulation No.12 of 2012, 84 respondents (82.4%) performed further socialization with the target of the socialization being midwives, cadres, community groups and patients (pregnant women and women giving birth).

Resources

For staff availability at the Wonogiri Regency Health Center, in the

category of nutrition workers staff there was still a shortage in nine health centers (27%) where the duties of the nutrition officer themselves were held by the health center midwife. Meanwhile, the availability of midwife staff is sufficient for all health centers in Wonogiri Regency. Thirteen (38%) of nutrition staff respondents had received training and 21 (61%) had never received training. Meanwhile, of the 34 midwife respondents, 19 (56%) had received training related to breastfeeding organized by the Health Office with funding from the State Budget.

Disposition

The disposition in this study is the respondent's attitude in implementing the exclusive breastfeeding policy. The lowest average was 1.21, which was shown by the attitude of the respondents who did not agree with the prohibition on distributors of infant formula milk and / or other baby products from giving gifts and / or assistance to health workers which could hinder the success of the exclusive breastfeeding program. Some respondents have a good attitude toward implementing exclusive breastfeeding policy, 68 respondents consented to exclusive breastfeeding practices or programs.

Organizational Structure

The bureaucratic structure studied in this study was the Standard Operational Procedure (SOPs), where in achieving the goal of implementing the exclusive breastfeeding policy at the health center it

is necessary to have SOPs on exclusive breastfeeding. In this variable, seven health centers (21%) already had exclusive breastfeeding SOPs, and 27 health centers (79%) did not. SOPs by seven health centers are related to exclusive breastfeeding counseling mechanisms and exclusive breastfeeding monitoring activities.

Implementation of Exclusive Breastfeeding Policy

Of the five inpatient community health centers in Wonogiri Regency, all of them have performed combined care for mothers and children (joint care). All health centers (five inpatient health centers and 29 outpatient health centers) in Wonogiri Regency have also provided a special room for breastfeeding or a lactation room wherein the lactation rooms in 21 health centers (62%) have met the minimum standards of Minister of Health Regulation No.15 of 2013. Regarding the distribution of exclusive breastfeeding achievements in Wonogiri Regency in 2018, most of the health centers had not reached the target of exclusive breastfeeding coverage; 24 health centers (70.6%) achieved the target, and 10 (29.4%) failed achieve the target of exclusive breastfeeding coverage.

The results of the cross-tabulation between the achievement of exclusive breastfeeding and implementing the exclusive breastfeeding policy to see how strong is the relationship between the two variables is illustrated in Table 1.

Table 1. Cross-tabulation between exclusive breastfeeding achievement and exclusive breastfeeding policy implementation factors

		Target of Exclusive Breastfeeding				Total		Contingency Coefficient
		Achieved (>66%)		Not achieved (<66%)				
		n	%	n	%	n	%	
Exclusive Breastfeeding Policy Knowledge								
Nutrition Officer	Good	6	46.5	7	53.8	13	100	0.199
	Enough	4	26.7	11	73.3	15	100	

		Target of Exclusive Breastfeeding				Total		Contingency Coefficient
		Achieved (>66%)		Not achieved (<66%)				
		n	%	n	%	n	%	
Midwife	Less	1	16.7	5	83.3	6	100	0.116
	Good	6	31.6	13	68.4	19	100	
	Enough	4	28.6	10	71.4	14	100	
	Less	0	0	1	100	1	100	
Health Cadre	Good	4	44.4	5	55.6	9	100	0.345
	Enough	6	35.3	11	64.7	17	100	
	Less	0	0	8	100	8	100	
Staff Availability								
Nutrition Staff	Sufficient	18	75	6	25	24	100	0.052
	Not sufficient	7	70	3	30	10	100	
Midwife	Sufficient	10	29.4	24	70.6	34	100	-
	Not sufficient	0	0	0	0	0	100	
Exclusive Breastfeeding Related Training								
Nutrition Staff	Ever	4	30.8	9	69.2	13	100	0.023
	Never	6	28.6	15	71.4	21	100	
Midwife	Ever	6	31.6	13	68.4	19	100	0.053
	Never	4	26.7	11	73.3	15	100	
Attitudes toward the Implementation of the Exclusive Breastfeeding Policy								
Nutrition Staff	Good	6	22.2	21	77.8	27	100	0.296
	Enough	4	57.1	3	42.9	7	100	
	Less	0	0	0	0	0	100	
Midwife	Good	6	28.6	15	71.4	21	100	0.023
	Enough	4	30.8	9	69.2	13	100	
	Less	0	0	0	0	0	100	
Health Cadre	Good	8	40	12	60	20	100	0.273
	Enough	2	15.4	11	84.6	13	100	
	Less	0	0	1	100	1	100	
Ownership of SOP								
Health center	Have SOP	3	42.9	4	57.1	7	100	0.149
	Doesn't have SOP	7	25.9	20	74.1	27	100	

Source: Data processing, 2020

DISCUSSION

Communication factors in the implementation of the exclusive breastfeeding policy in Wonogiri Regency

Communication is an important element in implementing a program. The main requirement in making effective policies is that those who implement a decision must understand what they have to do. Therefore, good communication plays an important role in the ongoing

implementation of the exclusive breastfeeding program in order to achieve the goals that have been planned in advance as desired. In this study, communication is divided into three aspects:

Clarity

The results of the cross-tabulation showed that there was a strong correlation between the knowledge of the cadres and the achievement of exclusive breastfeeding.

This is under the results of research that most cadres understand and know the contents of Government Regulation No. 33 of 2012, which contains exclusive breastfeeding. Meanwhile, the cross-tabulation of the knowledge of nutrition workers and midwives showed a weak correlation with the achievement of exclusive breastfeeding. This is because the majority of respondents have only adequate knowledge of Government Regulation No. 33 of 2012 relating to exclusive breastfeeding. Officers and midwives are executors / information outlets related to cadres' exclusive breastfeeding policies.

Most of the nutrition officers and cadres do not know and understand the contents of the policy. Nutrition officers and midwives have sufficient knowledge regarding respondents who do not understand the provision of access to information and education for the implementation of exclusive breastfeeding, which is the responsibility of the central, provincial and local governments. Many respondents do not know that the district / city government is responsible for providing guidance, monitoring, evaluation and overseeing the implementation of the exclusive breastfeeding program.

Many respondents also didn't know about the administrative sanctions imposed on health workers and health facilities for distributing formula milk. This statement is contained in Government Regulation No. 33 of 2012. As explained by Mufdlilah (2017), clarity of program content is an important aspect of communication. If the provision of information about policies isn't clear, it will cause misunderstanding between policy makers and implementers, in this case nutrition officers, cadres and midwives. Lack of clear communication, causes implementers not to know that local/city governments are responsible for providing guidance, monitoring and evaluation. Moreover, the absence of administrative sanctions has made implementers not implement policies

maximally. Socialization concerning Government Regulation No. 33 of 2012 on exclusive breastfeeding must be presented to respondents. This relates to how current conditions that affect the achievement of exclusive breastfeeding affect the implementation of the exclusive breastfeeding policy.

Consistency

Consistency in this matter relates to the implementation of the exclusive breastfeeding policy, the objectives of the policy implementation and the objectives of the exclusive breastfeeding policy carried out by the executor. In Wonogiri Regency itself 89.2% have received socialization related to Government Regulation No. 33/2012 and 82.3% have received information regarding Wonogiri Regent Regulation No 12/2012 which contains exclusive breastfeeding. Most of the respondents received socialization related to the policy from the health center for nutrition workers, midwives and health cadres. These outreach activities are usually performed during routine meetings or holding seminars or workshops at the local health center. The socialization of exclusive breastfeeding, whether given to health workers or cadres to be passed on to the community, is regularly and explicitly provided by the health center.

This is in line with research by Zainafree et al. (2016) which states that consistency of socialization is necessary in order to succeed in the exclusive breastfeeding policy. If the socialization is carried out consistently, the public will be educated. Under Government Regulation No. 33 of 2012 the responsibilities of district / city governments in the Exclusive Breastfeeding program include implementing national policies in the framework of the exclusive breastfeeding program and carrying out advocacy and dissemination of the program on a district / city scale. Meanwhile, most of the cadres had received socialization related to exclusive breastfeeding, which they

received from the health center. The health center has the role of delivering the socialization that has been provided by the local health office so that it is easy to implement existing policies.

Transmission

Transmission is delivering policy messages that must run well, where messages are designed as best as possible so that they are easy to understand, the selection of channels and communication media is appropriate and adapted to the conditions / situations of the recipient of the message, paying attention to the ability of the message recipient, considering possible disturbances and being designed to occur feedback (Ezafitria, 2019). In this research, transmission is carried out to disseminate the exclusive breastfeeding policy and this can be implemented to the executor and to the intended target. Respondents have implemented the exclusive breastfeeding policy and 91 respondents (89.2%) have carried out further socialization of Government Regulation No. 33 of 2012 and 84 respondents (82.4%) have carried out further socialization of the Wonogiri Regent Regulation No 12 of 2012 which contains information about exclusive breastfeeding. Respondents have carried out further outreach to the public according to the target they want to be socialized with. Nutrition officers and midwives usually provide socialization about exclusive breastfeeding to cadres, community groups, Family Welfare Movement mothers and pregnant and maternity patients. This outreach activity is the major function of nutrition officers and midwives. Whereas for cadres, it is common to provide socialization at cadre meetings, pregnancy classes, integrated health centers and community meetings.

This is in line with research (Khevabeta, 2017) which states that the dimension of clarity requires that policies be transmitted to implementers, target groups and other interested parties, both

directly and indirectly, and can be received so that they know what is the intent, purpose, objectives, and the substance of the public policy. The transmission dimension requires that public policies are not only conveyed to policy implementers but also to policy target groups and other interested parties, either directly or indirectly.

Resource factors in the implementation of the exclusive breastfeeding policy in Wonogiri Regency

Resources are a source of operational management for implementing activities. While communication has gone well, introducing the policy will not be successful if it is not supported by sufficient resources (Meyasa and Mawarni, 2015). Implementing the exclusive breastfeeding policy in the Wonogiri Regency needs resources to be used to implement the policy, including the availability of staff, staff training and funds.

Availability of Staff

The ability of the health center in implementing the exclusive breastfeeding policy also needs to be supported by enough nutrition workers and midwives. The results showed that the number of nutritionists remains low, but those in charge were midwives in nine (27%) health centers. As for the midwife staff, each health center has met the standards, 34 Health center in Wonogiri Regency already have their respective coordinating midwives, so we can say it that this is sufficient. As for the results of the contingency coefficient of the availability of nutrition staff at the health centers with the achievement of exclusive breastfeeding this was 0.023 and was included in the insufficient category in 24 (70.6%) health centers while the availability of midwife staff with exclusive breastfeeding was in the sufficient category, 34 people (100%). Fulfilling the minimum number of health workers at the health center will impact the

implementation of the exclusive breastfeeding policy properly and on target.

Health service providers must prepare better service capabilities because of the increasing demand for health services (Meyasa and Mawarni, 2015). The aim of increasing the achievement of exclusive breastfeeding in Wonogiri requires the alertness of officers or human resources in health services to disseminate information about exclusive breastfeeding policies, both national and regional policies. Therefore, the health center must be able to provide quality services with sufficient health personnel.

Staff Training

Besides the sufficient number of nutrition officers and midwives, nutrition officers and midwives must also have excellent skills. These will be gained through training. One of the training related to exclusive breastfeeding is breastfeeding counselor training (Ezafitria, 2019). Breastfeeding counselor training itself is not only intended for nutrition workers and midwives, but can also be given to health cadres and Empowerment of Family Welfare (EFW) mothers. The results showed the total number of nutrition officers and midwives who had not received training related to exclusive breastfeeding was 37 people from 34 health centers. The details of officers who have received training for nutrition officers are 13 people and midwives 19 people. Exclusive breastfeeding training is held by the health office, whereby not all health center health workers can attend the training. The health office will designate a representative health center to attend the training. This is intended so that health workers who receive training will transmit knowledge to other officers. The usual training held regarding exclusive breastfeeding is breastfeeding counselor training.

The results of a-cross tabulation of training obtained by nutrition officers with the achievement of exclusive breastfeeding

obtained a contingency coefficient value of 0.023, while the training obtained by midwives with exclusive breastfeeding attained a contingency coefficient value of 0.053. These results indicate that training for both nutrition workers and midwives has a weak correlation with the outcomes of exclusive breastfeeding. This is because there are still many respondents who have not received training related to exclusive breastfeeding. The training itself aims to increase and hone the skills possessed by officers as capital to facilitate the implementation of exclusive breastfeeding policies.

One of the HR management processes that is important in developing and improving the quality of human resources working in an organization is through training. According to Suaed (2017), training for health workers refers to the methods used so that health workers get the skills needed to do the job. Health workers who have good knowledge, abilities and skills will improve their own employability. Providing training to nutrition officers and midwives will increase their ability to implement exclusive breastfeeding policies. This is supported by research (Suaedi, 2017) which states that training (on-the-job training and off the job training) affects work ability at the Surabaya Hajj Hospital. Training is important to do to improve the competence of health workers.

Funding Source

The availability of funding sources is an important factor to finance policy implementation activities. We need the source of funds to fulfill the components for implementing policies related to exclusive breastfeeding. Funds are an important factor in determining the implementation of a policy. The results illustrate that the source of funds used by the health centers in the implementation of activities related to exclusive breastfeeding in implementing the exclusive breastfeeding policy comes from health

operational funds (BOK). The health centers in Wonogiri Regency use BOK funds from the APBD as funding for programs and activities related to exclusive breastfeeding. In addition, there is also a problem of limited funds, which are not only used to finance breastfeeding-related activities, but many health center activities and programs use BOK funds. Limited budget funds are one obstacle faced by the government, especially local governments and health centers as a program implementation so that it affects the achievement of the objectives of implementing the program or activity.

According to research (Andriani, Ainy and Destriatania, 2016), the limited budget causes the limited quality of health services that should be provided to targets so that it will affect the success of policy implementation. Besides policies cannot be implemented optimally, budget constraints also cause the disposition of policy actors to be low. Financial resources are very important in determining the success or failure of a program or policy, sometimes even programs require a large budget to produce quality programs or policies.

Disposition Factors in the Implementation of Exclusive Breastfeeding Policy in Wonogiri Regency

Disposition is an attitude that is owned and expressed by the implementer in the implementation of an exclusive breastfeeding policy (Parji, 2017). If the implementation is carried out successfully, the implementers must not only know what to do and should do, but must also have the will to implement the policy (Mufdlilah, 2017). Based on the findings of the research conducted in Wonogiri Regency, the majority of respondents agree with the attitudes of policy actors to implementation of an exclusive breastfeeding policy.

Besides analyzing how is the respondents' attitude in implementing the exclusive breastfeeding policy, an analysis was also carried out for the respondents'

attitude toward implementing the exclusive breastfeeding policy, which obtained that most of the respondents had a good attitude, namely 68 respondents who agreed with the activity or program in the implementation of the exclusive breastfeeding policy. The presence of respondents who are sufficient does not mean they do not agree with the implementation of the policy, but there are statements that both nutrition officers, midwives and cadres do not agree with. Statements about government interference will make it difficult to implement the exclusive breastfeeding policy. Respondents disagree with this statement, according to Government Regulation No. 33 of 2012 which states that the government, both central and regional governments, implements exclusive breastfeeding in their respective areas.

The results of cross-tabulation showed that the attitude of nutrition workers had a strong correlation with the achievement of exclusive breastfeeding with a contingency efficiency value of 0.296. The cross-tabulation results also showed a strong correlation for the attitudes of health cadres toward exclusive breastfeeding with a contingency coefficient value of 0.273. The attitude of the midwife shows that the cross-tabulation between the attitude of the midwife and the achievement of exclusive breastfeeding has a weak correlation with a contingency coefficient value of 0.023.

This is demonstrated by the number of respondents who agree with the implementer's approach to enforcing the exclusive breastfeeding policy. One of them is the existence of an exclusive breastfeeding policy in terms of the exclusive breastfeeding program and the availability of lactation space to implement the policy in order to achieve breastfeeding coverage according to the targets set. Cross-tabulation findings also revealed a strong association between the attitudes of health practitioners toward exclusive breastfeeding achievement. This is the

same as the attitude shown by the nutrition officers that the respondents agree with the presence of attitudes that represent the ability to endorse the implementation of the exclusive breastfeeding policy in order to achieve the predetermined objectives.

The findings of the research on the attitudes of midwives showed that there was a weak correlation between the attitudes of midwives and the achievement of exclusive breastfeeding. This is because many midwife respondents do not agree with the argument that a prohibition on distributors of infant formula milk and/or other baby products from giving gifts and/or assistance to health workers may impede the success of the exclusive breastfeeding program. Safitri and Puspitasari (2018) explain that the success of the exclusive breastfeeding program is down to the policy makers and also to the mother of the baby. Even if the formula milk distributor gives gifts or assistance during the introduction of the program and the mother of the infant is not informed of the value of exclusive breastfeeding, it is the same. In the study, the respondents carried out activities related to exclusive breastfeeding. Health centers stated an implementer must have the will to implement an exclusive breastfeeding policy. The success of policy implementation is measured not only by the degree to which policy actors know what to do and what they can do, but also by the ability of such policy actors to be positively inclined toward the policies being implemented.

Bureaucratic Structure Factors in the Implementation of Exclusive Breastfeeding Policy in Wonogiri Regency

Policy makers may know what to do and have sufficient desire and resources to do it, but their implementation may still hamper them due to the organizational structure they use. Two salient characteristics of the bureaucracy are standard operating procedures (SOP) and

fragmentation. Widodo (2013) states this organizational structure was developed as an internal response to limited time and resource management and should standardize work in complex and broad organizations; this organizational structure often remains valid because of bureaucratic rigidity.

The bureaucratic structure studied in this study is the standard operating procedure (SOP). SOP in implementing exclusive breastfeeding policy is a working mechanism in implementing exclusive breastfeeding policy. So that in achieving the goal of implementing the exclusive breastfeeding policy at the health center, it is necessary to have an SOP on exclusive breastfeeding.

Based on the results of research conducted by the health centers in Wonogiri Regency, it can be seen that seven health centers (21%) do not yet have exclusive breastfeeding SOPs and most of the health centers, 27 (79%), already have SOPs related to implementing programs or activities related to exclusive breastfeeding. The SOP itself is made by each health center and endorsed by the head of the health center as a form that the SOP has been legalized in its use. The types of SOPs that are already owned by the health center include the SOP for monitoring exclusive breastfeeding and exclusive breastfeeding counseling.

The cross-tabulation results show that exclusive breastfeeding SOP ownership in the health center shows that, with SOP ownership, the higher the achievement of exclusive breastfeeding is; the effect of these two variables shows a contingency coefficient value of 0.149 where the correlation is moderate. This relates to many health centers with exclusive breastfeeding that have not reached the target yet have SOPs related to exclusive breastfeeding.

Mufdlilah (2017b) explains that if the SOP is not clear, whether it concerns mechanisms, systems and procedures for implementing policies, division of main

tasks, functions, powers, and responsibilities among actors and disharmony relationships between implementing organizations, it will cause failure in policy implementation.

A similar research was conducted by Dolly Erlan Khevabeta (2017) which states that the bureaucratic structure variables comprising SOPs and fragmentation at Arga Makmur Health Center have a significant influence on the implementation of exclusive breastfeeding policy. We need awareness from the health centers to create and carry out activities under established standard operating procedures so that activities and programs can run as intended.

Implementation of Exclusive Breastfeeding Policy in Wonogiri Regency

Policy implementation studies are crucial for public administration and public policy. Policy implementation is one stage of public policy, between policy formation and the consequences of policies for the people it affects. If a policy cannot reduce the problem that is the target of the policy, it means that the policy has failed even though it has been implemented very well. Policies also failed if they are very well designed but not implemented by policy implementers optimally (Winarno, 2002). The implementation of the exclusive breastfeeding policy in Wonogiri Regency in this study is an activity carried out by the health centers for the implementation of exclusive breastfeeding, namely:

Mother and Child Care in Combined (For Inpatient Health center)

Room or combined ward is an inpatient room where the baby is within the reach of the mother for 24 hours. Medical indications are based on the medical condition of the baby and / or the mother's medical condition, which does not allow for combined care. This placement in one room or in a combined

care unit aims to make it easier for mothers to provide exclusive breastfeeding to babies. So that the baby gets sufficient milk intake and does not add any other fluids.

Based on the results of the research, however, all health centers, both inpatient and outpatient health centers in Wonogiri Regency, have performed combined care for mothers and children. The baby is fully in the same room with the mother during the treatment period at the health center. This makes it easier for mothers to give breast milk to their children. The existence of five inpatient health centers in Wonogiri Regency that have implemented policies for combined care of mothers and children, are considered as increasing the bonding between both. Besides, it also affects the success of exclusive breastfeeding.

Provision of Lactation Room

Facilities and infrastructure are supporting facilities that can make it easier for people to carry out their activities. The provision of appropriate infrastructure and services will allow people to use it well. Therefore, healthcare providers must provide the facilities and infrastructure as a form of implementing an exclusive breastfeeding policy, namely meeting the needs for space or lactation corner.

Special facilities for nursing and / or expressing breastmilk, the breastfeeding room are rooms equipped with facilities for breastfeeding and expressing breastmilk used for breastfeeding babies, storing expressed breastmilk, and/or breastfeeding counseling. Every manager of the workplace and organizer of public facilities must provide opportunities for mothers who work indoors and / or outdoors to breastfeed and / or express breastmilk during work at the workplace. One of these public facilities is the health center.

The results showed that all health centers in Wonogiri Regency had facilities for expressing breastmilk or lactation rooms. This is a health center accreditation

requirement that health centers must have lactation rooms; however, the use of these lactation rooms has not been maximized by the health centers.

The nursing room is designed in a permanent building, and can be a separate room or a part of the existing health service in the workplace and public facilities. Every workplace and public place must provide the facilities and infrastructure for the ASI Room according to minimum standards and as needed. Minister of Health Regulation No.15 of 2013 states that the minimum standards for lactation space are the availability of tables, chairs, sinks and hand washing soap (Ministry of Health Indonesia, 2013).

The results showed that there were 21 health centers in Wonogiri Regency that had met the minimum standards for lactation rooms and there were still 13 health centers (38%) that had not met the minimum standards set out in the Republic of Indonesia Minister of Health Regulation No. 15 of 2013 concerning procedures for providing special facilities for breastfeeding and / or expressing breastmilk. This can reduce the needs of nursing room users because of the lack of facilities provided by the health center.

CONCLUSION

Regarding the communication factor, the respondents have good knowledge regarding the policy of Government Regulation No. 33 of 2012. Respondents were consistent in getting socialization about exclusive breastfeeding policy and transmission to carry out further outreach. For the resource factor, Wonogiri Regency has sufficient staff, but in terms of training there are still midwives and many nutrition officers who have never received training. For the disposition factor, the respondents agree with the exclusive breastfeeding policy and the provision of a nursing room. However, in terms of bureaucratic structure, it was found that there were still many health

centers that didn't have exclusive breastfeeding SOPs. The implementation of exclusive breastfeeding policy in Wonogiri Regency includes the implementation of combined care and inpatient care at five health centers, and the provision of nursing rooms at all health centers (34) where 21 health centers (61.7%) have met the minimum standards for providing lactation according to Minister of Health Regulation No. 15 of 2013.

Suggestions for the Health Office Wonogiri Regency include providing maximum periodic outreach to nutrition officers and related midwives regarding Government Regulation No. 33 of 2012, increasing the ability of health centers to implement exclusive breastfeeding policies by providing adequate staff without double workload, hold regular meetings with health center officers, private practice midwives, clinics and hospitals to discuss the application of exclusive breastfeeding to foster commitment in implementing exclusive breastfeeding policies.

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DETERMINANTS OF CONTRACEPTIVE USE IN RURAL POOR AREAS: EVIDENCE FROM INDONESIA

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ABSTRACT

Introduction: Meeting the demands of reproductive health among women poses persistent issues, particularly for impoverished and rural women who face impediments to healthcare services. The goal of this study was to explore the factors that influence contraceptive use among poor women in Indonesian rural areas. **Methods:** This study is a further analysis of Indonesia Demographic and Health Survey 2017. The respondents were 10,199 poor women who lived in rural areas in Indonesia. This quantitative study is analyzed by using logistic regression adjusted for complex sample. **Results:** The prevalence of modern contraceptive use among respondents was 63.1% consisting of 4.4% traditional users and 58.7% modern contraceptive users. The occupation of the husband and the wish to have no more children were both linked to the usage of contraceptive methods among impoverished women in rural areas. Young women (aged 15-34) with a high parity (three and more), who had secondary education or less, who went to the health facilities, and who lived in Java-Bali were more likely to utilize contraceptive methods. **Conclusion:** Despite the numerous hurdles to reproductive healthcare, it is critical to focus on methods to improve contraceptive use among poor women in rural areas.

Keywords: Contraceptives, Indonesia, Poor, Rural

INTRODUCTION

One of the public health interventions aimed at preventing pregnancy and lowering the risk of maternal and child morbidity and mortality is family planning program (Hossain et al., 2018). Contraceptive methods, either temporary or permanent methods, help couples to space or limit their pregnancies (Peer et al., 2013; Wulifan et al., 2017). Ensuring access to contraceptive services for couples is needed to ensure the human rights to determine how many children they want and whether they want to space the pregnancy (Shiferaw et al., 2017). Unprotected intercourse raises the risk of unintended pregnancy, unsafe abortion and unfavorable health consequences (Lebese et al., 2013). Reducing the risk of unwanted pregnancy is a critical approach for alleviating poverty and improving women's health (Darney et al., 2013).

Between 1970 and 2017, contraceptive use is predicted to have accounted for a reduction of 37.5%-43.1% of maternal deaths in Indonesia (Utomo et

al., 2021). Family planning is one of the four pillars of safe motherhood initiatives, a preventive strategy against maternal, perinatal and infant deaths, together with the other three pillars: ANC, safe delivery, and essential obstetric care (World Health Organization, 1994).

Rumors, myths, misperceptions and misinformation related to contraceptive side effects or health concerns, such as menstrual irregularities and fear of infertility after discontinuing reversible contraception, affect contraceptive adoption among women in Indonesia and other countries (Amnesty International, 2010; Gayatri et al., 2022; Gueye et al., 2015; Odwe et al., 2021; Sedgh & Hussain, 2014). Moreover, spousal communication, beliefs and cultural factors affect the modern contraceptive acceptance, adoption and continuation (Adebowale & Palamuleni, 2014; Lebese et al., 2013; Muanda et al., 2017; Odwe et al., 2021; Peer et al., 2013). As a result, it's critical to ensure couples have comprehensive contraceptive services for meeting their reproductive goals.

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Meeting the needs of reproductive health among women faces persistent challenges, particularly for impoverished and rural women who face impediments to healthcare. Prior studies have identified predictor variables of contraceptive use such as women's age (Hossain et al., 2018; Mahato et al., 2020; Singh et al., 2020), women's education (Ontiri et al., 2019; Zegeye et al., 2021), women's occupation (Hossain et al., 2018), husband's education (Hossain et al., 2018; Singh et al., 2020), husband's occupation (Singh et al., 2020), children ever born (Adhikari, 2010; Desalegn et al., 2019; Lakew et al., 2013; Lasong et al., 2020; Schoemaker, 2005; Singh et al., 2020), visiting health facilities (Abraha et al., 2018; Kamal & Islam, 2010), husband's fertility desire (Gayatri & Utomo, 2019; Hossain et al., 2018; Ontiri et al., 2019), and region of residence (Gayatri & Utomo, 2019).

The strategic plan 2020-2024 of the National Population and Family Planning Board targeted to increase modern contraceptive prevalence rate (CPR) from 61.78% in 2020 to 63.41% in 2024 and reduce the unmet need for family planning from 8.6% in 2020 to 7.4% in 2024 (National Population and Family Planning Board, 2020). The target of the family planning program is calculated based on the national data. The most popular contraceptive method in Indonesia is injectable (National Population and Family Planning Board, 2018). Injectable is an effective contraceptive method if it is used correctly. Many women in Indonesia use injectables because they do not need to remember to take on oral contraception each day.

Increasing reproductive women's access to contraceptive services is projected to promote contraceptive adoption and reduce unmet family planning needs. To promote rights-based family planning, it is critical to identify characteristics linked to contraceptive usage, particularly for vulnerable groups of women living in rural areas under difficult

conditions. However, there are limited studies that analyze contraceptive use in this specific group of women in Indonesia.

The goal of this study was to determine the contraceptive prevalence among impoverished women aged 15 to 49 who lived in rural areas of Indonesia, as well as the factors that influenced contraceptive use. The study examines women who are vulnerable because of their socioeconomic condition. This research is very important for policy makers to determine priorities for family planning programs in specific areas.

METHODS

The analysis of contraceptive use in Indonesia used data from the Indonesia Demographic and Health Survey (IDHS) 2017. IDHS was conducted using a multi-stage sample design that produced national estimation on maternal and child health indicators. In the first step, 1,970 census blocks were chosen, including 1,012 census blocks in urban areas and 958 census blocks in rural regions, using a systematic proportional to size method. A set number of 25 families per census block were randomly picked in the second step. A total of 49,627 women between the ages of 15 and 49 were chosen and interviewed. (National Population and Family Planning Board, 2018).

The analysis was restricted to only rural poor women. Women aged 15 to 49 who lived in rural areas, lived in poor or poorest family conditions, and were married or living together with their spouses met the study's inclusion criteria. The indicator of poor and poorest is from the household wealth index in the IDHS questionnaire. The wealth index is calculated by using Principal Components Analysis (PCA) to determine the composite index (Croft et al., 2018; ICF, 2018). Some socioeconomic indicators of the household population in the IDHS questionnaire were used to determine wealth index such as drinking water

sources and treatment, sanitation/toilet facilities, housing characteristics (such as flooring materials or housing construction, cooking fuel), and the possession of durable household items such as phone, radio, television, refrigerator, and mode of transportation (motorcycle or car) (Croft et al., 2018; ICF, 2018; National Population and Family Planning Board, 2018). Then, the scores of wealth indicators were ranked for each respondent and distributed into five equal quintiles. The first quintile was categorized as poorest and the second quintile was categorized as poor.

Women who provided insufficient information about their contraceptive use and demographic features were omitted from the study. The weighted study sample utilized for analysis was 10,199 reproductive-age women in Indonesia who lived in rural regions and were in poor health, according to the inclusion and exclusion criteria.

The usage of contraception among women in rural poverty households was the study's main focus. The dependent variable was categorized into contraceptive user ($Y=1$) if women used any contraceptive methods (such as tubectomy, vasectomy, IUD, implants, injectables, oral contraceptive, barrier methods, LAM, withdrawal, rhythm, or other traditional methods) and non-contraceptive users ($Y=0$) if, at the time of the poll, women were not using any form of contraception.

There were nine predictor variables used in the analysis to explain the variability in contraceptive utilization among rural poor women in Indonesia. The factors were chosen based on their prior studies' contributions to contraceptive use. Those predictor variables were women's age classified in groups (15-34 and 35-49), the employment status of women and their husbands (not working or working), children ever born (0-2 children, 3 or more children), the experience of visiting a health facility in the previous semester (no or yes), and husband's wish for a child (both want no more, husband wants more,

husband wants fewer). The educational levels of women and their husbands were categorized into primary or less (for those who had no education or who had primary school education), secondary (for those who had junior or senior high school education), and higher (for those who had diploma or bachelor or master or doctoral degree education). The variable of region is divided into Java Bali and outer Java Bali. Outer Jawa Bali region is based on the areas of the respondent's living such as in Sumatra, Borneo, Sulawesi, Papua, Nusa Tenggara or other islands in Indonesia beside Java and Bali.

Stata 15.1 was used to conduct the statistical analysis. Sample weights were used in the analysis to consider the unequal probability to be selected as samples between strata. Due to the multi-stage sampling design, the study used "svy" in Stata to adjust the analysis by complex sample with strata, primary sampling unit, and weighted variable.

The data have been analyzed by using descriptive statistics and inferential statistics. Descriptive analysis was used to show the sample distribution, by using frequencies and percentages, according to socio-demographic factors. Descriptive statistics were also used to determine the contraceptive prevalence among rural poor women in Indonesia. The next step was bivariate analysis by using the Chi-square test. The multivariate analysis incorporated significant variables from the bivariate study. The determinants of contraceptive adoption among Indonesian rural poor women were studied using multivariate analysis. Multivariate logistic regression adjusted by complex sample became the main analysis in this study.

Complex sample used in this study have considered sample weights, and data collection by using stratification and cluster design. Cluster design in this analysis represents the population in specific region (province) in Indonesia. The association between contraceptive utilization and the predictor variables was

measured using odds ratios with a 95% confidence interval.

Before the surveys were conducted, the Demographic and Health Survey (DHS) Program (DHS-7) project met all of the standards of 45 CFR 46, "Protection of Human Subjects" from the Institutional Review Board (ICF IRB FWA00000845). The study participants signed informed consent before they were interviewed in the survey. After receiving permission from The Demographic and Health Survey (DHS) Program, this study used the IDHS dataset. This study's IDHS 2017 data did not include any personal information.

RESULT

Table 1 shows the characteristics of currently married or in-union women who resided in rural areas under difficult situations. The findings show that the proportions of women aged 15 to 34 and 35 to 49 are practically identical. The data also show that over 60% of the spouses had only a primary school education or none at all, about 58% of women lived in Java-Bali islands, 63% of women had two children or less, 62% of women were working while almost 99% of their spouse were currently working. Additionally, 50.5% of women visited health facilities in the previous six months. The results in the table also show that about three-quarters of husbands want fewer children than their wives.

Table 1. Individual characteristics for rural poor women of reproductive age by contraceptive use status, IDHS 2017

Characteristics	Non-contraceptive users (n=3,758)	Contraceptive users (n=6,441)	Total (10,199)
Women's age			
15-34	48,1%	50.6%	49.7%
35-49	51.9%	49.4%	50.3%
Women's Education			
Primary or less	56.4%	56.7%	56.6%
Secondary	39.1%	40.8%	40.2%
Higher	4.5%	2.5%	3.2%
Husband's Education			
Primary or less	56.6%	58.3%	57.7%

The unadjusted (crude) odds ratio (COR) and adjusted odds ratios (AOR) are shown in Table 2. The results of the multivariate model suggest that women aged 35-49 years were more likely to use contraceptive methods (AOR=1.32, 95 percent CI: 1.17-1.49) than women aged less than 35 years. Women who have primary or less education (AOR=1.59, 95 percent CI: 1.25-2.03) and women who have secondary education (AOR=1.68, 95 percent CI: 1.34-2.10) were more likely to adopt contraceptives than those who have higher education. When compared to women whose husbands did not work, women with working husbands were more likely to use contraceptives (AOR=1.94, 95% CI:1.28-2.95). In comparison to their counterparts, women with three or more children (AOR=1.35, 95% CI: 1.20-1.52) and women who visited health facilities in the previous six months (AOR=1.23, 95% CI: 1.10-1.37) were more likely to take contraceptives. When compared to couples whose husbands want fewer children than their women, those who want no more children were more likely (AOR=1.76, 95% CI; 1.48-2.10) to use contraception (AOR=1.76, 95% CI; 1.48-2.10). Furthermore, women from the Java-Bali islands were more likely to utilize contraceptive techniques (AOR=1.48, 95% CI: 1.29-1.70) than women from other Indonesian islands.

Characteristics	Non-contraceptive users (n=3,758)	Contraceptive users (n=6,441)	Total (10,199)
Secondary	39.9%	39.1%	39.4%
Higher	3.5%	2.6%	2.9%
Women's Occupation			
Not working	35.9%	39.9%	38.4%
Working	64.1%	60.1%	61.6%
Husband's Occupation			
Not working	2.0%	1.0%	1.3%
Working	98.0%	99.0%	98.7%
Children Ever Born			
0-2 children	65.2%	61.7%	63.0%
3 or more children	34.8%	38.3%	37.0%
Visit health facility in the previous 6 months			
No	53.2%	47.4%	49.5%
Yes	46.8%	52.6%	50.5%
Husband's fertility desire			
Both wants no more	7.9%	13.3%	11.3%
Husband wants more	14.7%	13.0%	13.7%
Husband wants fewer	77.4%	73.7%	75.0%
Region			
Java-Bali islands	63.6%	55.4%	58.4%
Outer Java-Bali islands	36.4%	44.6%	41.6%

DISCUSSION

Based on the Indonesia Demographic and Health Survey, 2017, this study looked at individual sociodemographic characteristics associated to contraception use among Indonesian rural poor women. The findings demonstrated that women's age, women's education, husband's employment status, children ever born, the experience of visiting health facilities in the previous six months and, region of residence had a significant influence on contraceptive use among rural poor women in Indonesia. According to the findings, 63.1% of respondents used contraception, with 4.4% using traditional contraceptives and 58.7% using modern contraceptives. In Indonesia, the contraceptive prevalence rate among impoverished women (63.1%) was slightly lower than the national average (63.6%) (National Population and Family Planning Board, 2018). Women's age, as expected, had a positive impact on

contraceptive use among Indonesian rural poor women. Contraceptive use was higher among older women than among younger women, which was consistent with other studies in India (Singh et al., 2020), rural Nepal (Mahato et al., 2020), and five Mesoamerican countries (Rios-Zertuche et al., 2017). The possible reason can be that women aged 35-49 years had already reached their fertility goals and desired to stop their childbearing. Additionally, the awareness of current contraceptive options was higher among older women from many sources of information including their peers, families, relations, or neighbors (Singh et al., 2020). However, some studies found that younger women were more inclined to use contraceptives, which they attributed to their husbands' better communication on family planning concerns and young women's values of having fewer children. (Bakibinga et al., 2019; Lakew et al., 2013; Zegeye et al., 2021).

Table 2. Logistic regression modelling associations between individual characteristics and contraceptive use among rural poor women, IDHS 2017

Characteristics	COR (95% CI)	AOR (95% CI)
Women's age		
15-34	1	1
35-49	0.90 (0.82-1.00)**	1.32 (1.17-1.49)*
Women's Education		
Primary or less	1.79 (1.44-2.24)**	1.59 (1.25-2.03)**
Secondary	1.86 (1.50-2.31)**	1.68 (1.34-2.10)**
Higher	1	1
Husband's Education		
Primary or less	1	1
Secondary	0.95 (0.86-1.05)	0.97 (0.86-1.08)
Higher	0.71(0.55-0.90)*	0.92 (0.69-1.23)
Women's Occupation		
Not working	1	1
Working	0.84 (0.75-0.95)*	0.92 (0.82-1.04)
Husband's Occupation		
Not working	1	1
Working	2.02 (1.33-3.07)*	1.94 (1.28-2.95)*
Children Ever Born		
0-2 children	1	1
3 or more children	1.16 (1.04-1.29)*	1.35 (1.20-1.52)*
Visit health facility in the previous 6 months		
No	1	1
Yes	1.26 (1.13-1.40)*	1.23 (1.10-1.37)*
Husband's fertility desire		
Both wants no more	1.76 (1.48-2.09)*	1.76 (1.48-2.10)*
Husband wants mor	0.93 (0.81-1.08)	0.93 (0.80-1.08)
Husband wants fewer	1	1
Region		
Java-Bali islands	1.41 (1.24-1.61)*	1.48 (1.29-1.70)*
Outer Java-Bali islands	1	1

Note: *: p-value < 0.01; **: p-value < 0.05; CI: Confidence Interval; AOR: Adjusted Odds Ratio; COR: Crude Odds Ratio

The data revealed that women's educational level had an impact on contraception use among Indonesian rural poor women. In this study, about 57% of women had primary or less education, which means that more than half of the rural poor women had lower educational levels and probably limited knowledge on contraceptive methods. Even though rural poor women had some disadvantages in socioeconomic conditions, including low educational level, the uptake of contraceptives was higher than those higher educated women. Free

contraceptive services offered by the government to the poor through Indonesia's National Health Insurance Scheme can help to minimize inequity in access to family planning services, allowing the poor to have free contraception (Teplitskaya et al., 2018). Moreover, massive and mobile family planning services have increased family planning provision among poor women. Therefore, uneducated or low educated women in Indonesia can access family planning services provided by the Government. The uptake of contraceptives

was still low among higher-educated women. This could be assumed that higher educated women were knowledgeable about contraceptive methods and reproductive health, so this can cause fear of the health concerns or long-term side-effects of contraceptives (Azmoode et al., 2017). Some previous studies, on the other hand, found that highly educated women were more likely to utilize contraception (Lasong et al., 2020; Ontiri et al., 2019; Zegeye et al., 2021).

Previous research has shown that contraceptive use is higher among women with a higher educational level because more educated women have better contraception knowledge and affluence, which influences their decision to limit birth by using contraception (Zegeye et al., 2021). Moreover, tertiary-educated women had better access to contraceptive information and services (Ontiri et al., 2019). Education improved women's self confidence in household decision-making related to their fertility goals (Acharya et al., 2010; Meskele & Mekonnen, 2014; Nadeem et al., 2021; Rahman et al., 2014). Prior research in India and Nigeria, on the other hand, found no link between women's education and contraceptive use (Chinaeke et al., 2019; Singh et al., 2020).

Among rural poor women, the variable of spouse occupation had the largest correlation with contraceptive use. It is probably attributed to the fact that, in a rural poor family, the employed husband is the only breadwinner and becomes the central decision-maker in family planning. The strong supports on the values of small families among employed husbands in rural areas with limited resources lead to the use of contraception (Muhoza & Ruhara, 2019). A study revealed that women who experienced economic hardship tend to have lower fertility preferences (Orbeta, 2005). Similar findings were found from another study in India (Singh et al., 2020). This could be due to better knowledge about all aspects of contraception among working husbands

and husband's support and involvement in the decisions that leads to better decision-making power for their wife to uptake contraceptive methods (Bogale et al., 2011). Moreover, working husbands had higher financial ability to buy contraceptive methods (Singh et al., 2020). Therefore, it is important to involve husbands as well as women when undertaking family planning programs and health promotion activities (Mahato et al., 2020).

The number of children ever born was found to be strongly linked to contraceptive use. Women with three or more children were more likely to adopt family planning methods than did women who had two or fewer children. This result is similar to other studies in Indonesia (Schoemaker, 2005), Ethiopia (Desalegn et al., 2019; Lakew et al., 2013), South Africa (Peer et al., 2013), Nepal (Adhikari, 2010), Zambia (Lasong et al., 2020), and India (Singh et al., 2020). According to a study on long-acting contraceptive use, nulliparous women are less likely to utilize long-acting contraceptives because they are afraid of infertility if they stop using them (Desalegn et al., 2019). Women with a high parity were more likely to utilize contraception because they wanted to stop their childbearing and they have already reached their desired number of children (Adhikari, 2010; Lakew et al., 2013). Moreover, women with three or more children had higher exposure on family planning information and services (Peer et al., 2013). Furthermore, satisfactory experience with the previous methods for spacing the pregnancies was associated with contraceptive choice and adoption (Odwe et al., 2021).

Women who went to a health facility the previous semester had a better chance than women who did not go to a health facility. This may be attributed to the fact that couples will receive information and counseling from healthcare providers on family planning for spacing or limiting childbearing. In the counseling process,

there were information exchange and interpersonal communication between women and healthcare providers. According to a previous study, healthcare counseling is an important strategy for satisfying unmet family planning needs and minimizing the risk of unwanted pregnancy (Chinaeke et al., 2019; Rios-Zertuche et al., 2017).

Visiting health facilities gives couples opportunities to access family planning services. Moreover, healthcare providers can inspire the couple who visited health facilities to accept contraceptives and motivate women by comprehensive counseling to encourage couples to use contraceptive methods (Kamal & Islam, 2010). The quality counseling on contraception not only increases contraceptives uptake but also increases contraceptives continuation (Dehingia et al., 2019). The counseling should include information on managing the potential side-effects after adopting contraceptives. Among postpartum mothers, visiting postnatal care services had increased the opportunity for family planning counseling, leading to the increase of their likelihood to adopt contraceptive methods during the postpartum period (Abraha et al., 2018).

Couples who did not intend to have children in the future were more likely to utilize contraception, according to the study. Other research backs up this conclusion (Gayatri & Utomo, 2019; Hossain et al., 2018; Ontiri et al., 2019). The desire to have children influences fertility rates especially among rural women (Wulifan et al., 2017). Those couples who decide to have no more children need to stop their childbearing by using contraceptive methods. These couples had met their reproductive goals by having sufficient numbers of children. Couples' communication in the numbers of children has a significant effect on adopting contraceptive methods to control their childbearing (Kamal & Islam, 2010). Consistent with findings from prior

studies, a study on long-acting reversible contraception showed that couples who had no desire for more children tend to use long-acting contraceptives to prevent unintended pregnancies for a longer period of protection (Ontiri et al., 2019). A study in the Democratic Republic of Congo showed that husband's opposition to family planning was a substantial obstacle for contraceptive adoption in rural areas (Muanda et al., 2017). Spousal communication is important to have a similar perception and acceptance on family planning among husband and wife (Muanda et al., 2017). Furthermore, increasing marital communication may improve women's confidence in making decisions about their reproductive health in the home (Peer et al., 2013).

The study found that there were differences in contraceptive uptake across the regions in Indonesia. Geographic variability in contraceptive adoption might be a result of the difference in the availability of health facilities and healthcare providers in Java-Bali regions and other regions.

One of the study's strengths is the fact that it is based on a nationally representative sample of married women. However, there are several limitations to this research. Due to the nature of a cross-sectional investigation, the study was unable to determine the causal relationship between factors. Because the community characteristics related with contraceptive usage among poor women in Indonesia are not shown in this study, the variance of contraceptive utilization between communities cannot be determined.

CONCLUSIONS

According to this survey, around 63% of rural poor women use contraception to avoid pregnancy. Despite the numerous hurdles to reproductive health care, it is critical to focus on the strategies to improve contraceptive use among poor rural women. The

sociodemographic factors associated with the increase of contraceptive uptake were older women (AOR=1.32; 95% CI: 1.17-1.49), secondary schooling or less women (AOR=1.59-1.68; 95% CI: 1.25-2.10), working husbands (AOR=1.94, 95% CI: 1.28-2.95), had three or more children (AOR=1.35, 95% CI: 1.20-1.52), visited health facilities in the previous six months (AOR=1.23; 95% CI: 1.10-1.37), couples wants no more children (AOR=1.76; 95% CI: 1.48-2.10), and lived in Java-Bali islands (AOR=1.48; 95% CI: 1.29-1.70).

It is recommended to increase mass media campaigns and contraceptive services among poor households in rural areas, especially for younger women. Increasing awareness among young women and newlywed couples is urgent to remind them about high-risk pregnancy and adverse health outcome of adolescent pregnancy. Family planning programming must produce and provide clear and accurate messages that are easy to comprehend for rural poor women, so that they may obtain accurate information and eliminate contraception myths. The presence of a robust link between visiting health facilities and contraceptive adoption was discovered in this study. Therefore, it is crucial to address the likelihood of missed opportunities in order to ensure that women who visit health facilities and have an unmet need for contraception are provided with comprehensive counseling by healthcare providers. Healthcare providers also need to improve and update their abilities in providing contraceptive counseling and services through the specific training program. Young and disadvantaged women in rural regions require improved reproductive health services in order to have better access to safe and effective contraceptive options for spacing or limiting their family size. Future research should be based on a qualitative study that examines all supply and demand elements of contraception use among rural poor women.

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THE RELATIONSHIP BETWEEN EMOTIONAL EATING, MEAL SKIPPING AND UNHEALTHY FOOD CONSUMPTION PATTERN IN ADOLESCENT GIRLS

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ABSTRACT

Introduction: Psychological problems can lead to emotional eating and meal skipping, which may impact unhealthy food consumption patterns. This study aimed to assess the interrelationship between emotional eating, meal skipping, and unhealthy food consumption pattern in adolescent girls. **Method:** This cross-sectional study included 122 samples of adolescent girls aged 13-15 years. The study was carried out in Tangerang, in June 2021. The data of emotional eating were measured by Emotional Eater Questionnaire (EEQ), meal skipping collected by self-reported questionnaire of daily eating frequency, and unhealthy food consumption patterns measured by Food Frequency Questionnaires (FFQ). **Result:** The results showed majority of emotional eater subjects more often consumed fatty foods (76.6%). It's also found that adolescents skipping breakfast were high in consumed sweet foods (66.0%), while those skipping lunch (63.6%) and dinner (54.5%) were found higher to consume fatty foods than others. In addition, multivariate regression analyses showed that simultaneously between the variables, only emotional eating variables had a significant relationship with unhealthy food consumption patterns (p-value = 0.002), while meal skipping variables were not significantly related. **Conclusion:** It can be concluded that emotional eating can affect unhealthy food consumption patterns among adolescent girls, while meal skipping did not show any meaningful effect.

Keywords: adolescent, female, eating behavior, emotions, meals

INTRODUCTION

Adolescence has been proven as a second window of opportunity in affecting developmental pathways (including cognitive growth and development), establishing future habits, improving some poor childhood experiences (United Nations Children's Fund, 2021). Especially for adolescent girls, who would enter motherhood, not only for their health, the nutritional status will be important for the health of their offspring (WHO, 2014). When an adolescent girl is malnourished, it can impact the cycle of malnutrition for the next generation (SPRING and Save the Children, 2018).

Currently, almost the entire population in the world is facing the COVID-19 outbreak. Prior study has revealed that the prevalence of adolescents with psychological health problems was

high during these pandemics (Zhou et al., 2020). Other studies reported anxiety and depression were found higher in emotional eaters, which could impact on higher fat intake, fast food intake, more frequent consumption of sugary foods, and also reported were to eat fewer meals per day or skip meals (Di Renzo et al., 2020). It can be seen that psychological problems can lead to emotional eating and meal skipping, which may impact unhealthy food consumption patterns.

Emotional eating is defined as a tendency to abnormal eating because of a reaction to negative emotions, such as stress, anxiety, and depression (Van Strien and Ouwens, 2007). People who are under negative emotions can become prone to overeating or even undereating (Alalwan et al., 2019). Adolescents were more likely to consume unhealthy food frequently when in high emotional eating and adolescent girls

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were reported more frequent than boys (Bui et al., 2021). The majority of emotional eaters are found in overweight adolescents and reported eating more sweet snacks and drinks (Rachmawati, Anantanyu and Kusnandar, 2019). In contrast, a previous study has shown that neither high emotional eaters or low emotional eaters have differences in food intake (Van Strien et al., 2013).

Meal skipping has been frequently reported as a habit among adolescents. Skipping dinner can cause $\geq 10\%$ weight gain and overweight/obesity (Yamamoto et al., 2021). People who skip breakfast have also been found to be more overweight/obese than never-skippers (Wadolowska et al., 2019). Furthermore, skipping meals at school can impact less physical activity and energy (Wang et al., 2017). According to the healthy eating index (HEI), in comparison to skipping breakfast, consumption of seafood/plant proteins and vegetables in skipping dinner was reduced significantly (Zeballos and Todd, 2020). Meal skippers reported having a low consumption of fruits and vegetables, but a high consumption of added sugar, sodium, fat, and alcoholic beverages. (Rodrigues et al., 2017).

Increased consumption of unhealthy foods in adolescence will have an impact on nutritional problems. Globally, 20.4% (8.4% girls and 12.4% boys) children and adolescents were underweight (thinness), prevalence of adolescents with obesity in 1975 which increased from $<1\%$ to more than 5% in girls and almost 8% in boys in 2016. Based on Indonesian Basic Health Research (*Riskesdas*) surveys, it shows increasing prevalence of overweight and obesity which was originally 10% in 2013 to 16% in 2018. Moreover, Indonesia is still dealing with anemia among adolescents aged 15-24 years; the survey revealed that the prevalence of iron deficiencies anemia was increased from 8.4% in 2013 to 32% in 2018 (Basic Health Research, 2018).

Nutrition during adolescence is needed to support physical and cognitive

growth and development, provide adequate energy stores for pregnancy, and prevent the onset of nutrition-related diseases in adulthood (WHO, 2006). Adolescent girls are related to a major contribution to pregnancy and birth safety when they become mothers in the future. Adolescent girls who marry at a young age have anemia and underweight problems and can be at risk of giving low birth weight babies (Bappenas, 2012). Therefore, eating behavior and healthy eating patterns need to be implemented in order to meet nutritional needs and avoid nutritional problems in adolescents.

Different from previous study that examined the association of emotional eating and meal skipping on unhealthy food consumption patterns involving adolescent girl and boy subjects (Bui et al., 2021; Yamamoto et al., 2021), this study only focuses on adolescent girls. Moreover, based on existing evidence, we hypothesize that emotional eaters tended to be meal skippers and have contributed to unhealthy food consumption patterns. Therefore, this study aimed to assess the interrelationship between emotional eating, meal skipping, and unhealthy food consumption pattern in adolescent girls.

METHODS

This observational analytic study used a cross-sectional design conducted in Tangerang City, in June 2021. There are 122 subjects involved in this current study. All subjects were adolescent girls aged 13-15 who lived with parents, were capable of communicating online, and were in a healthy condition during the study. Subjects excluded from the study were adolescents on medication that consumed anti-depressants, mood stabilizers, anti-anxiety, stimulants for appetite or weight gain/loss, smoke, drink alcoholic beverages, adolescents on diets and have a disease that can affect food consumption patterns, such as heart, cancer, and diabetes. All subjects involved have received an explanation

about the study and have agreed to participate in the study using informed consent.

Since the present study was conducted in a COVID-19 outbreak, the data were collected online. Variable of emotional eating was measured with Emotional Eating Questionnaire (EEQ) (Garaulet et al., 2012). This questionnaire has been used and validated on Indonesian adolescent subjects in previous studies (Rachmawati, Anantanyu and Kusnandar, 2019). The EEQ includes 10 items with a four-point Likert score (1 for “never”, 2 for “sometimes”, 3 for “often”, and 4 for “always”). The total score will be categorized into “non-emotional eater” for 0-5, “low emotional eater” for 6-10, “emotional eater” for 11-20, and “very emotional eater” for 21-30 (Garaulet et al., 2012). Meal skipping data were collected by asking how many ate three regular meals (breakfast, lunch, and dinner) per day in the past week. The subjects will be divided into two groups; those who had three regular meal intakes during 6-7 days in the past week will be categorized as Regular Meal Consumer (RM), and those who had under 6-7 days in a week will be categorized as Meal Skipper (MS) group (Kim et al., 2012). While unhealthy food refers to foods that significantly increase the risk of disease, it does not immediately pose a risk of harm; the component that attributes risk are food substances themselves (e.g., fat, sugar, or salt). Unhealthy food groups consist of certain kinds of fast food, sugary drinks, and processed foods high in sodium, sugar, and fat (Barnhill et al., 2014). Unhealthy food consumption patterns were calculated by Food Frequency Questionnaires (FFQ) which include a total of 28 item questions of types of sweets food (5 items), sweets beverage (7 items), salty food (4 items), fatty food (4 items), and fast food (8 items) (Sirajuddin, Surmita and Astuti, 2018). The unhealthy food types were developed from The Questionnaire of Indonesian Basic Health Research in 2018, and the types of food in this questionnaire

were obtained from surveys related to foods that are often consumed among adolescents. Subjects who never consumed a type of food will be scored 1, score 2 for 1-3 times a month, score 3 for 1-2 times a week, score 4 for 3-4 times a week, score 5 for daily, and score 6 for more than twice a day. Each individual scoring result will compared with the mean of population and categorized into “often” if the score < mean or “not often” if the score \geq mean (Sirajuddin, Surmita and Astuti, 2018).

The current study used the Chi-square test to analyze the characteristics of subjects and the interrelationship of emotional eating, meal skipping, and unhealthy food consumption pattern was analyzed by binary logistic regression. SPSS V.23 was performed for all statistical analyses. All subjects were explained about the objective and management of the study. The Ethics Committee of Faculty Medicine, Sebelas Maret University in Surakarta approved this study No.40/UN27.06.6.1/KEP/EC/2021.

RESULT

A total of 122 adolescent girls aged 13-15 years were included in this study. Table 1 shows that among 122 subjects, 43 (35.2%) were aged 13 years, 64 (52.5%) were aged 14 years, and 15 (12.3%) were aged 15 years. The majority (58.2%) of the subjects' mother's education was middle, others were high (13.9%) and low education (27.9%). According to The Tangerang City Regional Minimum Wage in 2021 which was 4.262.015.37 IDR per month, 54.9% of parents had an income above it and 45.1% were below it. Based on eating behavior, the majority of adolescent girls were emotional eaters (38.5%), others were low-emotional eaters (37.7%), non-emotional eaters (19.7%), and very-emotional eaters (4.1%). Moreover, most adolescent girls were breakfast skippers (41.0%), while others were lunch skippers (27.0%) and dinner skippers (27.0%).

Table 1. Distribution of Subjects' Characteristics

Category	N = 122	
	n	%
Age (years)		
13	43	35.2
14	64	52.5
15	15	12.3
Mother Education		
Low	34	27.9
Middle	71	58.2
High	17	13.9
Parent Income*		
< Regional Minimum Wage	55	45.1
≥ Regional Minimum Wage	67	54.9
Emotional Eating		
Non-Emotional Eater	24	19.7
Low-Emotional Eater	46	37.7
Emotional Eater	47	38.5
Very Emotional Eater	5	4.1
Breakfast		
Regular Meal Consumer	72	59.0
Meal Skipper	50	41.0
Lunch		
Regular Meal Consumer	89	73.0
Meal Skipper	33	27.0
Dinner		
Regular Meal Consumer	89	73.0
Meal Skipper	33	27.0

Note : (*) The Tangerang City Regional Minimum Wage in 2021 was 4.262.015.37 IDR per month

The difference between emotional eating and meal skipping based on types of unhealthy food is shown in Table 2. Table 2 shows that adolescent girls who are emotional eaters were reported to more often consume fatty food (76.6%), than consume sweet food (61.7%), salty food (59.6%), and fast food (59.6%). In addition, the Chi-square test indicated that emotional eating and unhealthy food consumption patterns statistically were significantly different, with a p-value 0.016 (< 0.05).

Examining meal skipping, Table 2 shows that adolescent girls who were breakfast skippers were found more often to consume sweet food (66.0%), compared

with salty food (56.0%), fatty food (58.0%), and fast food (56.0%). Moreover, adolescent girls who were lunch skippers were reported more often to consume fatty food (63.6%), than sweet food (54.5%), salty food (54.4%), and fast food (60.6%). While, adolescent girls who were dinner skippers were found more often to consume fatty food (54.5%), compared with sweet food (42.4%), salty food (51.5%), and fast food (39.4%). However, the Chi-square test indicated that meal skipping, including breakfast (p-value = 0.581), lunch (p-value = 0.684), dinner skipping (p-value = 0.415) and unhealthy food consumption patterns, statistically were not significant different.

Table 2. Difference of Emotional Eating and Meal Skipping Based on Types of Unhealthy Food

	Unhealthy Food Consumption Pattern								P
	Sweets Food		Salty Food		Fatty Food		Fast Food		
	Seldom	Often	Seldom	Often	Seldom	Often	Seldom	Often	
Emotional Eating									
Non-EE	17 (70.8)	7 (29.2)	16 (66.7)	8 (33.3)	11 (45.8)	13 (54.2)	16 (66.7)	8 (33.3)	0.016*
Low-EE	21 (45.7)	25 (54.3)	24 (52.2)	22 (47.8)	22 (47.8)	24 (52.2)	23 (50.0)	23 (50.0)	
EE	18 (38.3)	29 (61.7)	19 (40.4)	28 (59.6)	11 (23.4)	36 (76.6)	19 (40.4)	28 (59.6)	
Very -EE	1 (20.0)	4 (80.0)	1 (20.0)	4 (80.0)	2 (40.0)	3 (60.0)	2 (40.0)	3 (60.0)	
Breakfast									
RM	40 (55.6)	32 (44.4)	38 (52.8)	34 (47.2)	25 (34.7)	47 (65.3)	38 (52.8)	34 (47.2)	0.581
MS	17 (34.0)	33 (66.0)	22 (44.0)	28 (56.0)	21 (42.0)	29 (58.0)	22 (44.0)	28 (56.0)	
Lunch									
RM	42 (47.2)	47 (52.8)	45 (50.6)	44 (49.4)	34 (38.2)	55 (61.8)	47 (52.8)	42 (47.2)	0.684
MS	15 (45.5)	18 (54.5)	15 (45.5)	18 (54.4)	12 (36.4)	21 (63.6)	13 (39.4)	20 (60.6)	
Dinner									
RM	38 (42.7)	51 (57.3)	44 (49.4)	45 (50.6)	31 (34.8)	58 (65.2)	40 (44.9)	49 (55.1)	0.415
MS	19 (57.6)	14 (42.4)	16 (48.5)	17 (51.5)	15 (45.5)	18 (54.5)	20 (60.6)	13 (39.4)	

Note: Non-EE: Non Emotional Eater, Low-EE: Low Emotional Eater, EE: Emotional Eater, Very-EE: Very Emotional Eater, RM: Regular Meal Consumer, MS: Meal Skipper, (*) Chi-square test with significant p-value < 0.05

The logistic regressions for multivariate analysis are presented in Table 3. It shows that adolescent girls who are emotional eaters were statistically significant with unhealthy food consumption patterns, with a p-value 0.005 (< 0.05), which indicated that emotional eating contributed to affecting unhealthy food consumption patterns. Moreover, the value of Odds Ratio (OR) adjusted by education level of mother and father, and average income level of both parents was 4.79 (95% CI: 1.60-14.38); it means that adolescent girls who were emotional eaters

had risk 4.79 times of consuming unhealthy foods, compared to those who were not emotional eaters.

However, the meal skipping variables, including breakfast skipping (p-value = 0.461), lunch skipping (p-value = 0.721), and dinner skipping (p-value = 0.189) were not statistically significant with unhealthy food consumption patterns, both in univariate analysis or in multivariate analysis involving control variables. It indicated that meal skipping, including breakfast, lunch, and dinner skipping, did not significantly contribute to affecting unhealthy food consumption patterns.

Table 3 Relationship between Emotional Eating, Meal Skipping, and Unhealthy Food Consumption Pattern

	Unhealthy Food Consumption Pattern								
	Frequency		Crude OR			Adjusted OR**			
	Seldom n (%)	Often n (%)	OR	95%CI	P value	OR	95% CI	P value	
Emotional Eating									
Non-EE	17 (70.8)	7 (29.2)	Ref.			Ref.			0.018*
Low-EE	26 (56.5)	20 (43.5)	1.85	0.64-5.39	0.257	1.90	0.64-5.55	0.247	
EE	17 (36.2)	30 (63.8)	4.43	1.51-12.99	0.007*	4.79	1.60-14.38	0.005*	
Very -EE	1 (20.0)	4 (80.0)	7.90	0.71-88.13	0.093	9.22	0.79-107.97	0.077	
Breakfast									

	Unhealthy Food Consumption Pattern							
	Frequency		Crude OR			Adjusted OR**		
	Seldom n (%)	Often n (%)	OR	95%CI	P value	OR	95% CI	P value
RM	38 (52.8)	34 (47.2)	Ref.			Ref.		
MS	23 (46.0)	27 (54.0)	1.35	0.61-2.98	0.445	1.35	0.61-3.00	0.461
Lunch								
RM	46 (51.7)	43 (48.3)	Ref.			Ref.		
MS	15 (45.5)	18 (54.5)	1.25	0.51-3.09	0.627	1.19	0.46-3.07	0.721
Dinner								
RM	42 (47.2)	47 (52.8)	Ref.			Ref.		
MS	19 (57.6)	14 (42.4)	0.57	0.24-1.38	0.214	0.55	0.22-1.35	0.189

Note: Non-EE: Non Emotional Eater, Low-EE: Low Emotional Eater, EE: Emotional Eater, Very-EE: Very Emotional Eater, RM: Regular Meal Consumer, MS: Meal Skipper, Ref: Reference, (*)Logistic Regression test with significant p-value < 0.05, **OR adjusted by education level of mother and father, and average income level of both parents.

DISCUSSION

This current study found that the prevalence of emotional eating among adolescent girl subjects was 42.6%. It means almost half of the total subjects were emotional eaters, even very emotional eaters. Several previous studies have shown evidence that adolescent girls tend to be more emotional eaters than boys (Rachmawati et al. 2019, Bui et al. 2021). One of the influencing factors is stress: adolescent girls tended to eat to release stress compared with boys (Choi, 2020). The psychological factors, including perceived stress, worries, and tension/anxiety were correlated with emotional eating among adolescent girls, while in boys it was affected only by confused mood (Nguyen-Rodriguez, Unger and Spruijt-Metz, 2010). Other than that, adolescent difficulties in emotional regulation may lead to be emotional eaters (Evers, Stok and de Ridder, 2010). Individuals who experienced high-stress levels had a lower ability on eating regulation and it was also found that higher emotional eating correlates to higher eating dysregulation (Tan and Chow, 2014). Moreover, this study showed that statistically emotional eating and unhealthy food consumption patterns were significantly different. Adolescent girls who are emotional eaters were found to

more often consume fatty food, and sweet food than those who not were non- or low-emotional eaters. Similar results of previous study found that frequent consumption of fast foods, high-fat snacks, dessert foods, sugar-sweetened beverages (SSBs), and processed meat products was associated with high emotional eating among adolescents (Bui et al., 2021). Emotional eaters were reported affected to higher frequent snacking of sweet food, which caused weight gain and contributed to overweight (Rachmawati, Anantanyu and Kusnandar, 2019). Different results from other studies indicated that neither high emotional eaters or low emotional eaters have differences in food consumption. This study explained that emotional eaters were frequently to be found eating more after sad than joy mood condition, whereas those with low-emotional eating were eating the same amount after sad and joy mood condition (Van Strien et al., 2013). Another study explained that emotional eaters not only tended to overeat, but also tended to undereating as a response to negative emotional states, such as anger, stress, and anxiety. A person can show a different response in a negative emotional state. A person in a negative emotional state such as boredom produces a response of increase in appetite, whereas a state of sadness will

produce a decreased appetite response (Bongers et al., 2013).

Since the study was conducted during the COVID-19 pandemic, stress was one of the main predictors of emotional eating (Al-Musharaf, 2020). The linking process of stress to emotional eating has been studied. When people were under stress, mainly chronic stress, balance energy intake and homeostatic needs could be dysregulated by decreasing (e.g., leptin, insulin) and increasing appetite-inducing hormones (e.g., ghrelin), then the condition could lead to overeating on comfort food (high sugar and fat) to fulfill physiological requirements (Dallman, 2010). The meal skipping in this current study consisted of skipping breakfast, lunch, and dinner. The proportion of breakfast-skippers among adolescent girl subjects was 41.0%, while lunch and dinner skippers were 27.0%. It showed that nearly half of adolescent girl subjects were breakfast skippers. These results were supported by a previous study in which the prevalence of meal skipping based on gender was found higher among adolescent girls than boys (Bui et al., 2021). Although our study did not assess the reasons for meal skipping, other studies have revealed that perceived lack of time was reported as the most influential factor to meal skipping (Pendergast et al., 2016). Meal skipping or irregular three main meals consumption may impact poor health and nutrition, such as weight gain, which can lead to metabolic syndrome (Rodrigues et al., 2017). A recent study revealed that people who skip breakfast have been found to be overweight/obese more than never-skippers (Wadolowska et al., 2019). On the other side, a retrospective cohort study reported that males or females who are dinner skippers have a closer association with weight gain and overweight/obesity than breakfast skippers. Energy intake between people who had dinner regularly and who skipped dinner has differences. Dinner skippers were related to having a higher irregularity of energy intake at dinner than those who had dinner regularly

(Yamamoto et al., 2021). Related to previous studies, the effect of genotype related to obesity on BMI adolescents could be modified by meal frequency consumption. The regular five-meal-a-day pattern has been proven to attenuate the effects of the alleles risk on genetic sensitivity to increased BMI (Jääskeläinen et al., 2013). Low diet quality can be another factor that is potentially linked with skipping dinner and weight gain. According to the components of the Healthy Eating Index (HEI), dinner skippers have decreased more in vegetables and plant proteins/seafood than breakfast-skippers, so it can lead to weight gain (Zeballos and Todd, 2020). Unfortunately, our study did not measure nutritional status. This is due to research conducted during the COVID-19 pandemic.

Our present results of different meal skipping in unhealthy food consumption found that adolescents skipping breakfast were high in consuming sweet food, while those skipping lunch and dinner were found to higher consume fatty foods than others. Similar to a prior study, in comparison with adolescents who were breakfast consumers, those breakfast skippers were found to be high in consuming added sugar (Deshmukh-Taskar et al., 2010). Another study revealed that people who rarely eat breakfast/skip breakfast have been shown to consume more cookies, cake, and meat at dinner, compared to those who regularly have breakfast (Min et al., 2011). However, the Chi-square test revealed that meal skipping with unhealthy food consumption patterns has no meaningful differences.

Our findings from regression analyses indicated that emotional eating variables were significantly associated with unhealthy food consumption patterns, while meal skipping variables, which consists of breakfast, lunch, and dinner skipping, were not statistically significant associated with unhealthy food consumption patterns. Which means there is no simultaneous relationship between emotional eating variables and meal skipping variables with

unhealthy food consumption patterns or it can be said that, simultaneously, emotional eating can affect unhealthy food consumption patterns among adolescent girls, while meal skipping has not shown any meaningful effect. In addition, the Odds Ratio value of emotional eaters was 4.79 (95% CI: 1.60-14.38), and showed an increase after being controlled by education level of the father and mother, as well as the average income level of both parents. The OR indicated that adolescent girls who were emotional eaters had risk 4.79 times of consuming unhealthy foods, compared to those who were not emotional eaters.

Examining the interrelationship of emotional eating and meal skipping, from a previous study we know that negative emotions, including stress, anxiety, and depression, were initially related to emotional eating (Alalwan et al., 2019). Furthermore, other studies have assessed that mental health problems risk, such as stress, depressive mood, and suicidal ideation, was found to be increased in adolescents who skipped breakfast and skipped meals more than once per day (Lee, Han and Kim, 2017). Therefore, the involvement of negative emotions (e.g., depressive, stress, and anxiety) for those emotional eaters may cause a tendency to skip meals. It can cause preferring to consume unhealthy foods. The interrelationship between emotional eating, meal skipping, and unhealthy food consumption was reinforced by a recent study which states that the habits of eating to relieve stress in the high-stress group were reported higher than the low-stress group, as well as a higher frequency of meal skipping (breakfast, lunch, and dinner), eating unhealthy foods, such as fast food or ready prepared meals, snacks (e.g., cakes, soft drinks, and candies), and overeating (Choi, 2020). One thing that needs to be considered in overcoming emotional eating is managing stress. Considering that people tend to eat to release stress, education on stress management should be provided. Moreover, the availability of healthy food

choices in the canteen, along with nutritional information, can be an effort to reduce unhealthy food consumption patterns (Choi, 2020).

Apart from the eating behavior variables studied in this research, there are other factors that can influence unhealthy food consumption patterns. Several studies have examined other factors that influence unhealthy food consumption patterns, including binge drinking, eating together with other activities, smoking, and a sedentary activity (Bui et al., 2021). Another study documented that, according to the Theory of Planned Behavior (TPB), the most potent predictors of fast-food consumptions were subjective norms followed by perceived behavioral control (Rouhani-Tonekaboni, Seyedi-Andi and Haghi, 2018). Families' income levels, father's education levels indicated more tendencies toward frequency consumption of junk food (Mirhadyan et al., 2020).

Based on the results, the majority of adolescent girls reported frequent unhealthy food consumption that can increase the risk of health problems. In line with the results, the Indonesia basic health research (Riskesmas) showed that the adolescent age group tended to have a higher risk food consumption pattern, compared to other age groups. Compared to 2013, consumption of risky foods among the Indonesian population aged 10-14 years in 2018 was increased. Moreover, unhealthy food consumption patterns can be reflected in the lack of consumption of vegetables and fruit. There were 96.8% of the population aged 10-14 years that consumed vegetables and fruits less than the recommended portion per day (Basic Health Research, 2018).

The increasing of unhealthy food consumption patterns in adolescents can impact being overweight to obesity in adulthood (>18 years). Obesity in females was found higher than in males. In 2016, about 13% (11% male and 15% female) of the world's adult population was obese (WHO, 2020). While the prevalence of

obesity in Indonesian adults (> 18 years) was also shown to be higher in women than men. Moreover, there is increasing of obesity prevalence in adults (>18 years) from 22.9% (12.9% female and 10.0% male) in 2013 to 43.8% (29.3% female and 14.5% male) in 2018 (Basic Health Research, 2018).

Healthy food consumption pattern in adolescents needs to be implemented to meet the nutritional needs, as an effort to prevent nutritional problems in adulthood. Nutrition during adolescence should be adequate for physical and cognitive growth and development. Especially for adolescent girls, adequate nutrition provides energy stores for pregnancy, and give protection to the nutrition-related diseases in adulthood (WHO, 2006). Adolescent girls were associated with a major contribution to health during pregnancy to childbirth. Adolescent girls who married at a young aged, having anemic and underweight nutritional status will lead to having babies with low birth weight (LBW) (<2500 gram) (Ministry of National Development Planning, 2013).

A healthy diet can provide protection from malnutrition and non-communicable diseases related to diet. The WHO has recommended healthy dietary practices/healthy diet. A healthy diet must consist of balancing calories in and out, eating a minimum five portions or 400 g of fruits and vegetables in a day, consuming fats less than 30% of total energy and limiting food containing saturated fats, avoiding trans fats from industrially-produced, consume salt less than 5 g per day, and reduced intake of sugars to less than 10% of total energy intake (WHO, 2019). Moreover, balanced nutrition guidelines also have been implemented in Indonesia. There were four pillars of recommendation to balance between nutrients that come in and out, including eating a variety of foods, having a clean and healthy lifestyle behavior, doing physical activity regularly, and regularly n observing

body weight to keep a normal weight (Ministry of Health RI, 2014).

There are several methodological limitations in this study, including the design of the current study was cross-sectional, which can't analyze the causality between variables. The study data were collected online, which may influence false answers. This study used self-report questionnaires which may lead to the subjectivity of respondents. This study was only focused on adolescent girls and can't see the differences based on gender. Furthermore, the research of the relationship between these three variables is still limited and to find out more about the causal pathway of the interrelationship between emotional eating, meal skipping, and unhealthy food consumption pattern, future longitudinal studies are needed. It will be useful for making targeted interventions.

CONCLUSIONS

Individuals who are emotional eaters were found more often to consume fatty foods than other types of unhealthy food. Emotional eating can affect unhealthy food consumption patterns among adolescent girls, while meal skipping did not show any meaningful effect. However, to prevent possible negative health outcomes, continuing education is still important to do.

Our suggestion is that schools can make a special time for providing education related to nutrition and healthy eating behavior by regularly presenting an expert in nutrition (nutritionists).

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WORKERS' BEHAVIOR AND FORCED VITAL CAPACITY (FVC) BATIK WORKERS IN BATIK JETIS VILLAGE, SIDOARJO

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ABSTRACT

Introduction: Batik is the art of drawing on the surface of the cloth. The process of making batik can cause problems for worker's health. Batik workers interacted directly with chemical materials when producing batik and this material was dangerous for their health. This study aims to determine the behavior and Forced Vital Capacity (FVC) of batik industry workers in Kampung Batik Jetis, Sidoarjo. **Method:** This research is an observational study with a cross-sectional study design. This research was conducted from August to October 2019, located in the batik industry of Batik Jetis Village, Sidoarjo sub-District, Sidoarjo District. The sample was taken by total sampling with Inclusion criteria are research subjects who had age more than 20 years old and willing to be a research sample. Samples consisted of 9 batik workers from Batik Jetis village. Data were collected by observation and interviews, and the measuring of Forced Vital Capacity (FVC) using a spirometer. **Result:** Showed that 66.67% of respondents are ≥ 50 years old, 66.67% respondents in the obese category, 77.78% respondents had worked for more than 10 years, 33.33% respondents with a duration of work > 8 hours/day, 77.78% did not have smoking behavior, only 1 respondent (11.11%) had abnormal FVC. **Conclusion:** In summary, increase of age, abnormal nutritional status, working period, long duration of exposure and smoking behavior can cause FVC abnormalities, while physical activity (sports) has a positive relationship to FVC.

Keywords: batik workers, forced vital capacity, Batik Jetis Village, batik making.

INTRODUCTION

Batik art has been known in Indonesia since the Majapahit era. Batik is the art of drawing on the surface of the cloth which was originally only used for the clothing of the royal family, but the art of batik has grown and started to be used widely (West Java Provincial Government, 2017). Batik art is divided into three types based on the making method, namely the first was batik *tulis* (hand-drawn batik) or traditional batik, the second was batik *cap* (hand-stamp batik), and the last was a combination of both batik hand-draw and hand-stamp (Soebaryo and Budianti, 2018). Batik has various patterns such as Arabic calligraphy, European garland, Chinese phoenix, bad peacock, and other patterns (UNESCO, 2009). The art of batik is growing both nationally and internationally;

the batik industry can have export markets to many countries such as Japan, America, and Europe. Even batik industry played the main role in the growth of the textile and apparel industry sector in the first quarter of 2019, which recorded the highest position around 18.98% (Ministry of Industry, 2015). Batik value production in Indonesia can reach 407.5 billion rupiah per month or equivalent to 4.89 trillion rupiah per year and this production achievement was supported by 37,093 batik workers (Siregar et al., 2020).

Batik has been appointed as an Indonesian Cultural Heritage, namely an intangible cultural heritage by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 2009 (Steelyana, 2012). Following the Government's Vision in the 2015-2019 National Medium Term Development Plan

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(RPJMN), the realization of a sovereign, independent, and personality-based Indonesia based on cooperation, the empowerment of Small and Medium Industries is currently directed at having medium-term goals to realize small and medium industries. Competitive medium industries, play a significant role in strengthening the national industrial structure, alleviating poverty and expanding job opportunities, and producing industrial goods and / or services for export (Ministry of Industry, 2019). The existence of Kampung Jetis as a collection of many small and medium batik industries is one way to develop national economy.

The process of making batik in Batik Jetis village was similar to other areas, including 4 major stages (Soebaryo and Budianti, 2018). The first stage or the pretreatment was preparing the clothes or material/ mordanting using alum or potassium aluminum sulfate. After the first stage, the second stage continued with designing/ drawing the clothes or blocking part of the clothes with melted wax. The clothes were covered with a coat of liquid wax using a special tool called canting. This tool like a fountain pen, a smaller chopper container with a thin spout connected to a short bamboo handle. This canting was filled with liquid from melted wax and the batik workers used this canting to draw the design on the surface of the clothes. After drawing on the surface of the clothes, then the wax was cooled off and continued with the next stage. The third stage was coloring/dyeing or filling the clothes with colors. This stage was a technique of covering the part surface of the clothes that will not receive color. The clothes were dipped three to four times in the container filled with natural dye. The waxed areas on the surface of the clothes would keep the original color. When the wax was removed, the contrast area between the colored and uncolored areas formed the pattern. The clothes were left to dry on their self then the wax can be removed. The last stage of making batik is fixation using alum,

tunjung, or *kapur tohor*. After fixation then the clothes were dried.

The process of making batik can cause problems for worker's health. Batik workers interacted directly with chemical material when producing batik and this material was dangerous for their health. According to Junaidi et al. (2017), during the process of making batik, there are many hazards in the batik industry area. Several hazards in batik industry area namely, the low category were in the *nyanting* room, washing and drying rooms, and the waste management room with hazard percentage was 10.26%. The batik workers can be exposed to hot steam inhalation and skin irritation due to body exposure to coloring agents. Medium category hazard namely in the stamp room with hazard percentage was 30.77%, the batik workers can be exposed to hot steam inhalation and burns if exposed to the hot wax and high category hazard namely the coloring room with hazard percentage was 38.46%, the batik workers can be exposed to inhaled the coloring agent and skin irritation due to body exposure to the coloring agent (Junaidi, Fatoni and Fatimah, 2017).

Malam is a traditional wax that is commonly used in the process of making batik. This wax is not pure but a mixture of paraffin, microcrystalline, beeswax, and triterpenoid resin (Febriana et al., 2020). The emission from paraffin wax burning can produce a variety of polluting materials which was harmful to human health especially in the respiratory system. These polluting materials can cause respiratory irritation and shortness of breath (Massoudi and Hamidi, 2017). One of the examination results was done at the Bantul Environmental Health Engineering Center (BBTKL) revealed that the dominant gas contained in the melting process of *Malam* (batik wax) was Carbon Monoxide (CO). According to research by Manubari, Alhamidy and Nurini (2019) H₂S from the burning of batik wax can trigger cell death and inhibit proliferation of the cell, and CO gas produced from burning of batik wax can

also bind with hemoglobin, which should bind oxygen, and this process causes hypoxia in the tissue. Poisoning of CO can cause mild to severe symptoms. According to Hess (2017), mild symptoms that can be experienced by people or workers with CO poisoning were fatigue, malaise, headache, dizziness, confusion, disorientation, blurred vision, nausea, vomiting. Moderate symptoms were chest pain, respiratory depression, non-cardiogenic pulmonary edema, ataxia, syncope, tachypnea, dyspnea, palpitation, rhabdomyolysis. Severe symptoms were hypotension, arrhythmia, myocardial ischemia, coma, and seizures (Hess, 2017).

Research conducted by Latif (2016) regarding batik with the population of this study were all batik industry workers in the City of Pekalongan in 634 batik industries and the sample in this study was 80 respondents who were taken by random sampling. It was found that health problems among batik workers were in the form of lung disease problems, 67.5%. Munthe's research (2014) in the laweyan batik village, Surakarta, has a relationship between exposure to wax smoke and changes in lung function, although statistically, it does not state. The group exposed to wax smoke had a 4.67 times greater risk of developing lung function abnormalities than the non-exposed group.

According to the risk of health in batik workers, the authors researched about

the relationship between Force Vital Capacity (FVC) with individual characteristic included age and nutritional status and workers behavior included working period, duration of exposure, and smoking behavior in Batik Jetis Village, Sidoarjo. This study aims determined the relationship between Force Vital Capacity (FVC) with individual characteristic and worker behavior in Batik Jetis Village, Sidoarjo.

METHODS

This research is an observational research which is conducted without giving intervention to the research subjects. Data were collected directly in the field by means of interviews and observations. The research design used cross-sectional, independent variables, and observed variables at the same time (period). From this study, it was obtained an overview of the graduation from the Ethics Commission of the Faculty of Dentistry, Airlangga University No. 565 / HRECCFODM / VIII / 2019.

Time and Location of Research

This research was conducted from August to October 2019, located in batik industry at Batik Jetis village, P. Diponegoro Street, Sidoarjo sub-district, Sidoarjo District.

Table 1 Variables, Operational Definition, Measurement Method, Criteria and Research Data Scale

No	Variable	Operational Definition	Measurement Method	Category	Research Data Scale
	Nutritional status	Health status that results from the balance of fulfillment of nutrients and nutritional needs.	Measurement of weight and height	1. Thin :<17 dan 17.0-18.5 2. Normal : >18.5-25.00 3. Obese : 25.00->27.00	

No	Variable	Operational Definition	Measurement Method	Category	Research Data Scale
	Age	The length of life of the respondent was calculated from the time he was born to the time of the interview based on the year of birth.	Questionnaire	1. 17-26 years 2. 27-36 years 3. 37-46 years 4. > 46 years	Ordinal
1	Working Period	Length of work was calculated from the first time respondents made batik until now	Questionnaire	1. < 5 years 2. 5-10 years 3. > 10 years 4. >15 years	Ordinal
2	Duration of exposure	The length of time the respondent was exposed to smoke while working was calculated in hours per day	Questionnaire	1. ≤ 8 hours/ day 2. > 8 hours/ day	Nominal
4	Smoking Behavior	Smoking is a daily habit of smoking cigarettes	Questionnaire	1.yes 2.no	

Population and Sample Size of Research

The survey was conducted in the batik jetis village, P. Diponegoro Street, Sidoarjo sub-District, Sidoarjo District, and showed there were 18 workers. The sample was taken by total sampling. Inclusion criteria were research subjects which had age more than 20 years old and willing to be a research sample. Exclusion criteria were subjects who the researcher did not make this subject into the sample. Exclusion subjects in this study included workers who were not willing to be research subjects, have dentures, sick and resigned.

The sample size in this study used the entire population, the researcher will make the entire population to be subject as long as it was not included in the exclusion criteria, but when the research was taking place, only 9 workers were ready to become respondents because there were sick, resigned and unpleased workers to become respondents.

Research Variable

The dependent variable is a variable that occurs because of the influence of the independent variable. The dependent variable in this study is the vital capacity of the lung. The independent variable is a variable that affects the dependent variable. The independent variables in this study were temperature, humidity, age, years of service, use of PPE while working, duration of contact with wax smoke, nutritional status, physical activity, smoking.

Data Collection Techniques and Instruments

Data were collected directly by observation and interviews. Observation and Interviews were done by researchers and officers to see individual characteristic and worker behavior of batik industry workers. Measurement and data collection of the individual characteristic and workers behavior can be seen in Table 1.

Forced Vital Capacity (FVC) is a vital capacity obtained in the expiration process quickly and strongly. Measurement of the FVC used a spirometer. The following were categories in the assessment of the pulmonary forced vital capacity, 1 was normal (Vital Capacity (VC)% > 80 and Forced Expiratory Volume 1 (FEV1) / Forced Vital Capacity (FVC) > 75), 2 was restriction (VC% < 80 and FEV1 / FVC < 75), 3 was obstruction (VC% > 80 and FEV1 / FVC < 75).

RESULT

Individual Characteristic

The total respondents in this study were nine respondents of batik workers in Batik Jetis Village, Lemahputro Village, Sidoarjo District. Interviews were conducted to determine individual characteristics of batik workers including age and nutritional status of workers.

Individual Characteristics

Individual characteristics in this study included age and body weight. Age in this study is defined as the time that the respondent is present from birth to the time the study was conducted and expressed in years. The results of the research on the age of workers can be seen in Table 2. The distribution of worker characteristics by age was presented in Table 4. Based on the results of research on 9 respondents, it was found that the majority of respondents were ≥ 50 years old with a percentage of 66.67%.

Nutritional Status

Nutritional status is a health status that is obtained from a balance of fulfillment and nutritional needs. Measuring nutritional status was done by measuring body weight and height to calculate according to BMI (Body Mass Index) formula. The nutritional status category was divided into 3 categories, namely thin, normal and obese.

Based on the results of the study, six respondents (66.67%) had nutritional status

with obese category, one respondent (11.11%) had underweight nutritional status, and two respondents (22.2%) had normal nutritional status. The results of this research on the workers nutritional status can be seen in Table 2 and Table 5.

Batik Workers Behavior

Interviews and observation were conducted to determine the behavior of batik workers, included working period, duration of exposure, and smoking behavior.

Working Period

The working period is the length of time the respondent has worked until the research is carried out. The working period can be categorized into: New work period that is < 5 years, Old work period is ≥ 5 years. Working period > 5 years, the potential for experiencing vital lung disorders is 8 times greater than the working period < 5 years. Based on the results of the study, it was found that 1 respondent (22.22%) had worked for < 10 years. Meanwhile, 8 respondents (77.78%) had a service life of ≥ 10 years. The results of this study based on the years of service of the respondents can be seen in Table 4 and the distribution of characteristics of respondents based on years of service can be seen in Table 6.

Duration of Exposure

Duration of exposure is defined as the length of time the respondent was exposed to CO while working, calculated in hours per day. According to the most recent CDC guidelines, duration of close contact is defined as a cumulative time of 15 minutes or more over a 24 hour period. The longer the duration of contact, the more likely the exposure will occur.

This study categorized the duration of exposure into two categories, namely ≤ 8 hours / day and duration of > 8 hours / day. Based on the analysis result, there were 14 respondents (87.5%) who have an exposure

duration of > 8 hours / day. Only 2 workers (12.5%) worked for ≤8 hours / day. The duration of exposure to the respondents can be seen in Table 4 and the distribution of respondents' characteristics based on the duration of exposure is presented in Table 7.

Smoking Behavior

Smoking behavior is a smoking habit that is done every day. Smoking is a necessity for someone who has a tendency to smoke. Cigarette smoke can interfere with this process so that the supply of O₂ to the tissue is reduced causes hypoxia and uninterrupted cellular metabolism as well as increased CO₂ in the blood and decreased vital lung capacity.

Data related to smoking behavior were obtained by interview and observation. Based on the research that has been done, there are 2 respondents who smoke behavior and there are 7 other respondents who do not smoke. The number of cigarettes consumed by smokers varies from 10 to 1 pack of cigarettes in one day. The results of observations and interviews on the smoking behavior of respondents can be seen in Table 4 and the distribution of respondent characteristics based on smoking behavior can be seen in Table 8.

Forced Vital Capacity Batik Industry Workers in Kampung Jetis, Sidoarjo District, Sidoarjo Regency

Table 2. FVC Inspection Results Based on Individual Characteristics of Batik Workers in Batik Jetis Village, Sidoarjo.

No.	Respondent	Age (Years)	BMI	Nutritional Status	FVC
1	Respondent 1	48	27.43129	Mild fat	Normal
2	Respondent 2	56	17.00882	light skinny	Normal
3	Respondent 3	58	25.06575	normal	Normal
4	Respondent 4	65	36.09607	Obese	Normal
5	Respondent 5	61	28.14787	Obese	Normal
6	Respondent 6	60	27.67874	Obese	Abnormal
7	Respondent 7	51	26.84067	Mild fat	Normal
8	Respondent 8	27	18.93878	normal	Normal
9	Respondent 9	39	22.03857	normal	Normal

Vital capacity, the volume of air released during maximum expiration after previously carrying out maximum inspiration. Vital capacities are very large such as inspiratory reserve volume plus tidal volume ($VC = IRV + ERV + TV$). Vital capacity 20 force (FVC) is a measure of the vital capacity obtained in the expression carried out creatively and as strongly as possible. This normal air volume value is approximately the same as VC.

Measurement of forced vital capacity was carried out by occupational health and safety officers from UPT K3 Surabaya. Based on this study, 1 respondent (11.11%) had abnormal lung force vital capacity (obstruction and restriction) and 8 other respondents (88.89%) had normal pulmonary FVC. Measurement of the forced vital capacity of the lungs using a spirometer, which is a tool to measure the forced vital capacity of the lungs. Autospiro brand AS 300, with this tool obtained data on the vital capacity of the lung, including: % FEV₁ and % FVC. The vital capacity of the lungs is measured with a spirometer in milliliters. Measurement of the vital capacity of the lung was carried out on all research subjects. The results of the measurement of the respondents' FVC can be seen in Table 2 and Table 3. The distribution of respondents based on the measurement of the FVC of the lungs is presented in Table 2 and Table 3. Table 9.

Table 3 Distribution of Characteristics of Respondents Based on Worker Age in the Batik Jetis Village Batik Industry, Sidoarjo District, Sidoarjo Regency in 2019

Age (Years)	Workers	
	N	%
20-35	1	11,11
36-49	2	22,22
≥50	6	66,67
Σ	9	100,00

Table 4 FVC Inspection Results Based on Batik Worker Behavior in Batik Jetis Village, Sidoarjo

No.	Respondent	Working Period (years)	Duration of Exposure		Smoking Behavior	Physical Activity (duration, frequency)	FVC
			Per Week (days)	Per Days (Hours)			
1	Respondent 1	8	6	7	No	<10 minute, >3 times	Normal
2	Respondent 2	16	7	>8		<10 minute, <3 times	Normal
3	Respondent 3	19	7	>8	No	<10 minute, <3 times	Normal
4	Respondent 4	30	6	7	No	<10 minute, <3 times	Normal
5	Respondent 5	36	7	6	No	30 minutes	Normal
6	Respondent 6	30	6	8	No	<10 minute, <3 times	Abnormal
7	Respondent 7	15	7	8	No	<10 minute, <3 times	Normal
8	Respondent 8	5	6	8	Yes	3 hours, <3 times	Normal
9	Respondent 9	17	6	8	Yes	No	Normal

Table 5 Distribution of Respondent Characteristics Based on Nutritional Status in the Work Environment in the Batik Jetis Village Batik Industry, Sidoarjo District, Sidoarjo Regency in 2019

Status Gizi	Pekerja	
	N	%
Normal	2	22,22
Kurus	1	11,11
Gemuk	6	66,67
Σ	9	100,00

Table 6 Distribution of Respondent Characteristics Based on Working Period in the Batik Jetis Village, Sidoarjo Regency in 2019

Working Period	Workers	
	n	%
< 10 years	2	22,22
≥10 years	7	77,78
Σ	9	100,00

Table 7 Distribution of Respondent Characteristics Based on Duration of Exposure in the Work Environment of Batik Jetis Village, Sidoarjo District in 2019

Duration of Exposure	Workers	
	n	%
≤8 hours/day	6	66,67
>8 hours/day	3	33,33
Σ	9	100,00

Table 8 Distribution of Respondent Characteristics Based on Smoking Behavior in the Batik Jetis village, Sidoarjo District in 2019

Smoking Behavior	Pekerja	
	n	%
Smoke	2	22,22
Didn't smoke	7	77,78
Σ	9	100

Table 9 Distribution of Respondents Based on Lung Physiology Status in the Work Place of Batik Jetis Village, Sidoarjo District in 2019

Forced Lung Vital Capacity Status	Workers	
	n	%
Normal	8	88,89
Abnormal (Restriction and obstructions)	1	11,11
Σ	9	100,00

DISCUSSION

Individual Characteristics

Individual characteristics of batik workers in this study included age and nutritional status.

Age

The distribution of respondent characteristics based on age in the Batik Jetis Village work environment showed that 66.67% of respondents are ≥50 years old.

People with more than 40 years old are the age which lung conditions can worsen more rapidly. Workers who had more than 40 years old have a higher risk of experiencing lung function disorders than workers aged < 40 years (Pinugroho and Kusumawati, 2017).

Nutritional Status

The distribution of respondent characteristics based on nutritional status in

the Batik Jetis village showed that the respondents in the obese category are the highest at 66.67%. The results of the analysis conducted by Wulansari (2019) showed there was a relationship between nutritional status and pulmonary function status. More nutritional status (obesity) was not good for a person's lung function capacity. As a result of obesity, there is additional adipose tissue on the chest wall and abdominal cavity which compresses the chest cavity, abdominal cavity and lungs (Wulansari, 2019).

Worker Behavior

Worker behavior in this study included working period, duration of exposure, and smoking behavior.

Working Period

The result observation and interviews were 22.22% respondents who worked for less than 10 years, while there were 77.78% respondents had worked for more than 10 years. The longer the work period, the longer the exposure or contact with the hazard. One of the wax content used for making batik was paraffin (Haerudin and Atika, 2018). The paraffin in this wax contained chlorine. Accidental inhalation of chlorine can cause both restrictive and obstructive lung disease. After chlorine was inhaled, there will be an infiltration of the inflammatory cells and there will be structural damage to the pulmonary (Jonasson, Koch and Bucht, 2013). People can be exposed with low to the high levels of chlorine (White and Martin, 2010).

Duration of Exposure

The characteristic distribution of respondents based on the duration of exposure was 66.67% who work ≤ 8 hours / day while respondents with a duration of work > 8 hours / day are 33.33%. The duration of exposure in this study was related to exposure to CO, which is a colorless, odorless, tasteless gas produced

by burning gasoline, wood, propane, charcoal, or other fuel. CO has a high affinity to bind hemoglobin (Hb) and forming HbCO. This chemical can compete with oxygen for binding with hemoglobin because CO has a high binding affinity, so CO will bind with hemoglobin and reduce oxygen-carrying capacity. In addition to Hb, CO also can bind other heme-containing proteins, include myoglobin in the heart and skeletal muscle, mitochondrial cytochrome c oxidase (Rose et al., 2017).

Smoking Behavior

The distribution of respondent characteristics based on smoking behavior was 2 respondents (22.22%) had smoking behavior and 7 people (77.78%) did not smoke. Batik industry workers smoked during breaks. Even though workers did not smoke while working, smoking can increase the risk of respiratory disease. A cigarette contains more than 4000 types of chemical compounds, 400 hazardous substances, and 43 carcinogenic substances. Carbon monoxide, tar, and nicotine were ingredients found in cigarettes (Ministry of Health of Republic of Indonesia, 2018).

Batik Workers' FVC

Based on the research results, it was found that only 1 respondent (11.11%) had abnormal FVC and 8 (88.89%) respondents showed normal FVC results. Based on these results, the percentage of workers who had normal FVC was more than those who were abnormal FVC. This was presumably because all workers did physical activity (sports) every week and most of the workers (66.67%) did not smoke. Lung vital capacity is an anatomical measurement that is affected by physical exercise and disease. The level of physical activity (exercise) has a positive effect on lung function capacity. The higher the sports activity, the better a person's lung function will be (Bagus, Inten D.P. and Dinata, 2020). FVC has a direct relationship to physical exercise. When people doing sports (physical activity), their

body will need oxygen as fuel for energy formation because the muscles are active. The way this is done to meet the oxygen demand for energy formation, the lungs will increase the respiration frequency which also cause increase lung vital capacity (Basuki and Jeny, 2017).

The results of this study showed that most workers (66.67%) did not smoke. The behavior of workers who do not smoke was thought to be a factor in the normal FVC results for most workers. One of the factors that cause a decrease of FVC was smoking behavior. The results of the analysis test with the independent t-test showed that there was a significant difference in the results of the FVC between smokers and nonsmokers (Barakati, Lintong and Moningka, 2015). This suggests that smoking can affect FVC. Tobacco is an ingredient in cigarettes that can endanger health. When smoking, harmful substances from cigarettes will enter by inhalation, causing tissue damage to the lungs including chronic obstructive pulmonary disease (COPD) (U.S Department of Health and Human Services, 2014, 2010). Expiratory flow-volume curves in young people who have smoked only a few years showed a decrease in flow rates at small lung volume indicating there was small airway obstruction. The research result conducted by Sushil and Mandira (2017) about the comparison of Pulmonary Function Test (PFT) between smokers and non-smokers showed that the value of PFT in smokers had a decrease compared with non-smokers. A common abnormality in lung smokers was an obstruction in the respiratory tract. Other research about comparison of pulmonary function tests between smokers and non-smokers was conducted by Hasan and Sulaiman (2018), and showed that the level of FVC in smokers was lower than non-smokers (Mohammed, Al-aaragi and Merzah, 2018). Increasing of smoking duration and number of cigarettes can decrease pulmonary function.

Research by Feldman and Anderson (2013) found that there was a different composition in the nasopharyngeal flora between smokers and non-smokers. The competitive aerobic organisms were fewer, increasing the number of pathogenic organisms, specifically *S. pneumoniae*, non-typeable *H. influenzae*, *Moraxella catarrhalis*, and *Streptococcus pyogenes* (Feldman and Anderson, 2013). The respiratory tract was chronically exposed to toxicants of cigarette smoke, primarily carbon and oxygen-centered radicals and other reactive oxygen species such as superoxide, hydrogen peroxide, hydroxyl radical, and nitric oxide. These toxicants can cause cellular damage and death, even cause the failure to activate critical intracellular signaling mechanisms that initiate protective host defense mechanisms; this reaction mainly occurred in the respiratory system.

The results of the FVC examination on batik workers in this study found as many as 1 out of 9 (11.11%) workers showed abnormal FVC status (restriction and obstructions). The characteristics of individual workers who had experienced abnormal FVC based on Tables 2 and 3 was 60 years old and nutritional status was in the heavy fat or obese category (BMI 27.67).

An abnormal FVC result in workers aged 60 years old can be caused by the age of the workers. A person's age can affect lung function. Workers with a work period of > 5-15 years were more at risk of developing lung function disorders compared to those aged < 5 years (Sekarini et al., 2019). Physiologically, lung function will decline at the age of 25-35 years as a result of increasing age. The lungs will undergo anatomical changes as we age, the alveolar ducts will widen due to the loss of elastic tissue so gas exchange surface area decreases, there is a reduction in the small bronchiolar diameter, enlargement of the terminal airspace, reduction in the total alveolar surface area, reduction in the number of capillaries per alveolus, and

degeneration occurs in a disproportionate number of myelinated phrenic nerve fibers which are a contributing factor to reduced strength of diaphragmatic contractility and decreased function of the diaphragm muscles. This appears to be the cause of lower maximal inspiratory pressure in older people (Hasan and Arusita, 2017). This shows that the older a person is, the less the lungs work. The this reduced lung action results in an abnormal FVC.

Nutritional status was measured by body mass index (BMI). Workers who experienced abnormal FVC in this study showed a BMI of 27.68 which was included in the category of heavy fat (obesity) nutritional status. A decrease in FVC can occur in obese people due to airway resistance. People with excess body fat distribution at the top cause the diaphragm to move to the abdomen and adipose that builds up on the chest wall can compress the chest cavity resulting in lower lung volume (Littleton, 2012).

Workers who experience abnormal FVC have a work period of > 10 years with a duration of 6 days per week and more than 8 hours per day and no respondent had abnormal FVC with ≤ 8 working hours. Longer duration of exposure can make workers exposed to chemical materials. The longer the working period, the higher the pollution concentration during batik making. Length of the working period can play a main role in the exposure or contact with hazard in industry batik area. Wax melting smoke exposure with variations of exposure time such as 3, 6, and 9 hours/day for 30 days causes narrowing of the tracheal diameter, decreased epithelial height, widening of the pulmonary alveoli diameter, thickening of the interalveolar septum, and emphysema. The biggest change occurred in the treatment group to exposure of melting wax in 9 hours/ day. So, the exposure length to batik wax smoke will cause malfunction of lung. Duration of exposure in this research was defined as the length of time the respondent was exposed to CO during working. Poisoning of CO

from the result of the melting wax process can cause mild to severe symptoms. According to Hess (2017), mild symptoms that can be experienced by people or workers with CO poisoning are fatigue, malaise, headache, dizziness, confusion, disorientation, blurred vision, nausea, and vomiting. Moderate symptoms are chest pain, respiratory depression, non-cardiogenic pulmonary edema, ataxia, syncope, tachypnea, dyspnea, palpitation, rhabdomyolysis. Severe symptoms are hypotension, arrhythmia, myocardial ischemia, coma, and seizures (Hess, 2017).

CONCLUSIONS

Based on the results and discussion that has been presented, it can be concluded that there is a relationship between age, nutritional status, working period, duration of exposure, physical exercise and smoking behavior on the FVC of batik workers. The higher the age, abnormal nutritional status, working period, long duration of exposure and smoking behavior can cause higher abnormalities in FVC, while physical activity (sports) has a positive relationship to FVC.

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CORRELATION BETWEEN COMPLIANCE WITH IRON TABLET CONSUMPTION AND IRON NUTRITION INTAKE WITH PREGNANT WOMEN'S HEMOGLOBINE CONSUMPTION

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ABSTRACT

Introduction: During pregnancy, the need for iron increases, which triggers anemia. Anemia can be described as a decline in the hemoglobin level below a critical level. Meanwhile, based on a preliminary study, 10 out of 13 pregnant women were not obedient in taking iron tablets (76, 92%). The prevalence of anemia at Tanah Kalikedinding Community Health Center in 2015 remained high. **Method:** The analytical study used a cross-sectional design. The group of pregnant women in the third trimester who received Fe tablets and had their Hb levels checked at the Tanah Kalikedinding Health Center Surabaya were 54 people. The sampling technique chosen was total sampling. The instruments used were questionnaire sheets, data collection sheets, and survey software. Data analysis used the Fisher exact test. **Result :** Out of the 54 pregnant women, 20.4% of pregnant women were obedient to taking blood-supplement pills and experienced an increase in hemoglobin levels (63.3%), 70.6% of pregnant women were not adherent, and almost all of them had decreased their. The results of a bivariate analysis using Fisher's exact showed a significance value of p-value = 0.001 < α = 0.05 (p < α). **Conclusion:** This meant a correlation between adherence to consuming Fe tablets and hemoglobin levels in pregnant women. Also, a p-value of 0.001 (p < α). This means there is a correlation between iron nutritional intake and consumption of blood-supplemented tablets and hemoglobin gravida levels at Puskesmas Tanah Kalikedinding, Surabaya.

Keywords: Pregnant, iron doses, iron consumption, hemoglobin

INTRODUCTION

The portrait of maternal health in a country can be viewed from maternal mortality or MMR. The results of the study from the Indonesian Health Demographic Survey explained that maternal health status in Indonesia still needs to be improved where there is an increase in MMR every year with the number of 228/100000 live births (2007) increasing to 359/100000 live births in 2012. The most significant causes of maternal mortality in Indonesia are pre-eclampsia, bleeding and infection (Ministry of Health, 2016).

Postpartum hemorrhage (Hemorrhagic postpartum) accounts for about 25% of maternal mortality in East Java; 70% of postpartum hemorrhage is due to uterine atony. Uterine atony can be interpreted as a condition of weak uterine contractions, which results in the uterus

being inadequate in closing blood flow from the former attachment (Langi et al., 2017). One of the predisposing factors that cause uterine atony is a mother who was anemic during pregnancy. Pregnancy with anemia is a condition of pregnant women at a hemoglobin level <11 g% in the first or third trimester of gestation and a hemoglobin level <10.5 g% in the second trimester of pregnancy. Anemic pregnant women have adverse maternal and neonatal implications (Adu-Afarwuah et al., 2017; Jorgensen et al., 2018).

One of the most common causes of anemia during pregnancy is iron deficiency. Iron deficiency anemia is caused by inadequate iron content in food, increased daily iron requirements, and chronic bleeding. Pregnant women have a high risk of iron deficiency anemia (Adu-Afarwuah et al., 2017; Abioye et al., 2019).

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Preventive measures to prevent iron deficiency anemia are implemented with a Fe supplementation program preferred for gravida patients. Iron supplementation is necessary during pregnancy because of the increased need for iron. In the form of tablets with blood added or called iron tablets, supplementation helps form erythrocytes and increases hemoglobin levels (Yadi and Jasda, 2019). Therefore, efforts were made to supplement iron with a predetermined dose of one tablet a day, or the equivalent of 60 mg elemental iron and 0.25 mg folic acid. The tablets are consumed during 90 days of pregnancy (Habib et al., 2018; Srivastava et al., 2019).

Iron (Fe) tablets are part of minerals in the human biological system, including during pregnancy. Where mothers need additional iron to increase the number and process of forming erythrocytes for the fetus and placenta. Fe supplementation during pregnancy is an appropriate intervention to improve the desired hemoglobin level. According to Rustam Mochtar (2012), if women regularly take 30 tablets of iron during pregnancy, it can increase Hb by 1 g%. This is also explained by consuming 30-60 mg iron tablets regularly per day. TTD can be started from 12 weeks of gestation until 12 weeks after delivery. This intervention's response can be monitored by improving the hemoglobin value, which increases at least 0.3 g / dl/week (Arisman and Kes, 2009). In 2014, the percentage of pregnant women receiving iron tablets in Indonesia was 85.1%; this figure has not met the national program target of 95% (M. of H. Indonesia, 2013). Although the coverage of women who get iron supplementation is quite good, if the drug is not taken entirely or partially, the planned drug benefits cannot be realized (M'Cormack and Drolet, 2012; Kadry et al., 2018).

According to Health Basic Survey of Indonesia in 2013, data show that 10.9% do not consume Fe, and 89.1% drink Fe. Of the 89.1%, 33.3% of women drank 90 iron tablets or more, 34.4% finished fewer than

90 iron tablets, and 21.4% forgot (P. D. S. K. Indonesia, 2013). Meanwhile, based on the results of a preliminary study conducted on 22-26 October. 2016, in the North Surabaya area, 13 pregnant women who had received Fe tablets showed that: three people (23.08%) regularly drank iron tablets and 10 people (76.92%) did not regularly drink TTD.

The results of the preliminary study showed that there were several reasons for the remaining tablets: six mothers (60%) forgot, three mothers (30%) could not stand side effects, one mother (10%) for other reasons, namely lack of appetite. Referring to this, non-compliance in taking blood-added tablet supplements needs attention because inadequate intake of Fe tablets can increase the risk of developing health problems for pregnant women, including anemia (Astuti et al., 2017).

Based on information from the Surabaya Health Office, the prevalence of pregnancy anemia in the Tanah Kali Kali Kedinding Community Health Center's working area was one of the highest in Surabaya in 2015 at 22.7%. This figure is above the prevalence of anemia in pregnant women in Surabaya in 2015, which was 7.18% (Department of Health, 2015). From the explanation and description of the information, this study aimed to determine the correlation between drinking iron supplement compliance and iron nutritional intake with the hemoglobin level of pregnant women at Tanah Kali Kedinding Health Center, Surabaya.

METHODS

The study was conducted in the form of a cross-sectional study. The population was determined to be gravida women in the third trimester who received iron supplementation and had their Hb levels checked at the Tanah Kali Kedinding Health Center, Surabaya, which occurred from March to April 2017.

The inclusion criteria set were: 1) Pregnant women given a TTD health centre

produced by PT. Kimia Farma (composition: 60 mg elemental iron and 0.4 mg folic acid); 2) TM III pregnant women with gestational age ≥ 34 weeks; 3) Pregnant women who have had Hb examination in the early trimester at Tanah Kali Kedinding Surabaya; 4) State that they are willing to be research respondents; 5) Able to verbal communicate well. Furthermore, the exclusion criteria were: 1) Pregnant women suffering from gastrointestinal/ chronic diseases / hemoglobinopathy; 2) Refuse to be research respondents; 3) Respondents who declined to re-check their Hb at the Puskesmas. The research variables consisted of: 1) The independent variable, namely compliance in consuming iron tablets and nutritional intake of Fe; 2) The dependent variable was the hemoglobin (Hb) level of pregnant women. The sampling technique chosen was total sampling. Adherence in consuming Fe tablets and nutritional intake of Fe became independent variables. Meanwhile, the Hb level of pregnant women is the dependent variable.

Data were obtained by using a structured interview guide in the form of a questionnaire to determine adherence in consuming iron pills (the number of Fe tablets consumed by pregnant women $\geq 90\%$ of 90 Fe tablets) and nutritional intake of Fe (total food intake consumed by pregnant women from the results Recall 2 x 24 hours, and nutritional survey software 2007) of pregnant women were used as primary data. The categories of Fe intake are: good, if $\geq 77\%$ of the RDA for iron in pregnant women, and less, if $<77\%$ RDA for pregnant women's iron.

Furthermore, the data used came from the Maternal and Child Health book as secondary data. These data are expected to be used to complement and support the preliminary information that has been collected. The data taken from the KIA book included data on pregnancy hemoglobin level examination, obstetric history and maternal health status.

The research was carried out through the following procedures: 1) The researcher submitted a research data collection request letter to the secretariat of the Airlangga University Midwife Education Study Program; 2) Conducted a research permit from the Surabaya Health Office; 3) Conducted research permission to the head of the Puskesmas; 4) The researcher took the initial information on women with TM III gestational age who received TTD and checked the hemoglobin level at the Puskesmas after obtaining research permission; 5) After getting the initial data, it continued with informed consent from prospective respondents; 6) Collecting primary data and secondary data on respondents willing to take part in the research. Furthermore, the data analysis process is divided into two, namely univariate analysis and bivariate analysis. In statistical analysis, the Chi-square test was performed. As another alternative test, Fisher's test was used. This analysis is used to determine the correlation between the two variables. If $p < \alpha = 0.05$, it can be concluded from the analysis that there is a correlation between the two variables.

The research was conducted after obtaining permission and approval to collect research data at the health center. Informed consent was provided before the study of pregnant women who met the inclusion criteria. If the respondent was willing, then they signed the agreement form. The Ethics Committee of the Faculty of Medicine, Airlangga University has issued a letter of ethical eligibility with letter number 92 / EC / KEPK / FKUA / 2017 for this research.

RESULTS

Characteristics of pregnant women

The following are the results of the distribution of respondent data from this study.

Table 1. Data for Pregnant Women

Characteristics	N	%
age		
<20 year	2	3.7
20-35 year	44	81.5
>35 year	8	14.8
Education		
Primary School	9	16.7
Junior High School	16	29.6
Senior High School	25	46.3
College	4	7.4
Profession		
Work	8	14.8
Doesn't Work	46	85.2
Gravida		
Primigravida	18	33.3
Multigravida	35	64.8
Grandemultigravida	1	1.9
Previous pregnancy spacing		
Never been pregnant	18	33.3
≤ 2 year	10	18.5
>2 year	26	48.1

Compliance with pregnant women taking blood booster tablets (TTD)

Table 2. Data on compliance of pregnant women taking iron tablets

Compliance with drinking TTD	N	%
Obey	11	20.4
Not obey	43	79.6
Total	54	100

Almost all of the 54 respondents (79.6%) did not comply with drinking iron tablets.

Nutritional intake of iron obtained from food

Almost all of 54 pregnant women (77.8%) got less nutritional iron intake from food, while a small proportion (22.2%) got good iron nutrition from food.

Table 3. Frequency distribution of Fe nutritional intake of pregnant women obtained from food

Nutritional intake of Fe from food	N	%
Good	12	22.2
Less	42	77.8
Total	54	100

HB levels of pregnant women before and after consuming TTD

The following is HB data for pregnant women before receiving iron tablets and after consuming iron tablets at the Kali Kedinding Health Center, Surabaya.

Table 4. HB levels before and after consuming TTD

Level HB (gr %)	N	%
Before		
≥ 11	46	85.2
<11	8	14.8
Total	54	100
Hb level value : 9.7 gr%- 16 gr%, mean ± SD : 12.7 ± 1.6		
After		
≥ 11	41	75.9
<11	13	24.1
Total	54	100
Hb level value : 8.7 gr%- 14.8 gr%, mean ± SD : 11.6 ± 1.25		

* The limit of Hb level 11 g% is the limit of anemia in pregnant women in the first or third trimester of pregnancy (Aryani, 2016).

Changes in the status of the hemoglobin level of pregnant women.

Nearly three-quarters (74%) of respondents' HB levels decreased, while a small proportion (13%) had increased Hb levels, and a small portion (13%) had fixed Hb levels.

Table 5. Hemoglobin status of pregnant women, gestational age ≥ 34 weeks

Hb Status	n	%
Increase	7	13
Fix	7	13
Decrease	40	74
Total	54	100

Research analysis

The following are the results of the variable statistical test that has been studied.

Table 6. Correlation of adherence to drinking iron supplement with HB conditions in pregnant women

Compliance	Hb levels for pregnant women						Total	p
	Increase		Fix		Decrease			
	n	%	n	%	n	%		
Obey	7	63.6	3	27.3	1	9.1	11	100
Not Obey	0	0	4	9.3	39	90.7	43	100
								0.001

Table 7. Relationship between nutritional intake and HB pregnant women

Nutritional intake of Fe from food	HB pregnant woman						Total	p value
	Increase		Fix		Decrease			
	n	%	n	%	n	%		
Good	5	41.7	4	33.3	3	25.0	12	100
Less	2	4.8	3	7.1	37	88.1	42	100
								0.001

DISCUSSION

Compliance is defined as a patient's commitment to undergoing therapy and advice given by health workers. Commitment to drinking iron tablets can be due to education, knowledge, support from the environment (husband and family), the role of healthcare, and the presence of iron tablets in health facilities (Prasetyo et al., 2009; Balasubramanian et al., 2016). However, in this study, only the respondents' reasons did not comply with the recommendations for the use of iron tablets and the details were not examined about the factors that influenced the compliance of pregnant women in consuming iron tablets.

The majority of respondents who were not obedient to drinking iron tablets were 31 women with multigravida pregnancies. In contrast, the group of respondents who were compliant in

consuming iron tablets were mostly respondents with primigravida pregnancies as many as six people. This finding does not follow previous results where the highest level of adherence was found in multigravida mothers at 60%. This discrepancy is caused because the experience factor influences it. Pregnant women with primigravida pregnancies do not have experience in undergoing pregnancy, so they tend to obey the iron supplement because they do not want bad things to happen to themselves and their babies (Utami et al., 2017; Kadry et al., 2018).

The accuracy of the respondent's behavior in drinking iron tablets according to health workers' instructions is the same as the daily dose of 1 tablet (composition: 60 mg elemental iron and 0.25 mg folic acid), where this provision is carried out routinely with a minimum time of 90 days when pregnant. The compliance variable

can be determined by measuring the percentage of the number of iron tablets consumed compared to the number of iron tablets which should be consumed. Pregnant women were categorized as adherent if they reached $\geq 90\%$ and non-adherent if the rate was $< 90\%$. The measurement of adherence in taking iron tablets is carried out to negate the hemodilution effect that occurs during pregnancy.

Compliance with iron tablets is essential to prevent pregnancy anemia. Non-compliance in drinking iron tablets can also be caused by a lack of communication between health workers and patients. Pregnant women also do not want to ask health workers about things that they do not understand so that at the time of implementation, there are still mistakes (Jirakittidul et al., 2019).

The low compliance of pregnant women to take iron tablets can be influenced by factors including in terms of programs and individual aspects: individuals do not feel sick and do not need drugs, ignorance of the signs of symptoms and their effects, low levels of motivation for pregnant women to drink iron tablets according to the predetermined time of administration. According to health workers, the less attractive color and taste of iron supplementation, fear of the unknown effects of iron supplementation by pregnant women, for example, can make a large fetus and can increase blood pressure, are factors to not comply.

Nutritional intake that contains iron is needed, especially by pregnant women, because there is an increase in maternal iron requirements for placenta and erythrocytes' formation. Daily iron requirements for the body can come from food sources or exogenous. Provision of iron from food can be increased through (1) Consumption of foods containing calories according to the needs of the body, (2) Increasing the availability of natural resources containing iron which can be used for food, disseminating information / promoting

foods containing iron and avoiding types of foods that reduce the absorption process of iron in the body (Yani, 2017; Srivastava et al., 2019).

Low iron intake can cause health problems for pregnant women. Nutritional problems can be multifactorial. The nutritional state of pregnant women can be related to the family / closest people's capacity to prepare food in sufficient quantities and various types, education and health behavior patterns, and the health condition of household members. Educational status and knowledge of a person are also crucial components that affect nutritional status (Safithri et al., 2019). However, according to the research analysis results, there is a discrepancy with this theory because there is no relationship between education and pregnant women's nutritional intake (Iqbal and Ekmekcioglu, 2019). Other factors that can affect the level of nutrition consumed by pregnant women include: 1) Socioeconomic levels; 2) Educational level; 3) Knowledge of mothers about foods rich in iron. The condition during pregnancy also affects, including hemodilution, bleeding and other diseases (gastrointestinal disorders, chronic diseases and hemoglobinopathy). This study also did not examine the factors affecting Fe's nutritional intake in pregnant women, so this is a limitation.

Furthermore, based on the relationship test analysis results, there was no correlation between the time of pregnancy and the Hb levels of the respondents. This condition contrasts with previous findings where there was a correlation between pregnancy distance and anemia's prevalence/incidence. This different condition can be because, during the first three months of pregnancy (TM I), the need for iron nutrition is still relatively small. At this time, there has been no hemodilution (Sunuwar et al., 2019).

In the final trimester of pregnancy, another Hb check is performed to determine the HB level of the pregnant woman. In these data, the findings show that the

majority of pregnant women's Hb levels decreased, namely by 40 people (74%), while the rest showed that Hb levels increased by seven people (13%), and fixed Hb levels by seven people (13%). A decrease in the hemoglobin status of pregnant women can be caused by iron deficiency in the body. This is because entering TM II and TM III, pregnant women get hemodiluted conditions, or it can be said that the blood is thin. This is because pregnant women experience an increase in plasma volume in the body that is not proportional to the increase in erythrocyte mass, which causes hemoglobin in pregnant women's blood to decrease (Morton, 2019). One of the results showed that changes in hemoglobin concentration would change as gestational age increases. At TM I gestational age, HB levels appear to have decreased, except in women with low hemoglobin (<11.5 g%). The most inadequate HB label was found when a pregnant woman was at TM II gestational age or around 30 weeks of age. In TM III pregnant women, an increase in HB levels in the blood was obtained except for the condition of women who had high HB levels (> 14.6 g%) at the time of the first test (Padang and Idris, 2019; Putro et al., 2020b). This condition is directly proportional to the findings of this study in which among women who experienced elevated Hb levels almost all had baseline Hb levels <11.5 g%.

Based on the Fisher exact test, with a significance level of $\alpha = 0.05$, a value of $p = 0.001 < \alpha = 0.05$ ($p < \alpha$) was obtained, which means a significant relationship was found between drinking iron supplement compliance with HB levels of pregnant women at the study site. This finding explains the same as previous studies where there was a correlation between the level of adherence to consuming iron tablets with an increase in HB levels in a health facility in the city of Semarang (Puspita et al., 2019).

In this study, the results obtained were one person who obeyed taking iron tablets, but the respondent had a decrease in

Hb levels. This can be due to the inadequate intake of Fe from food, so it cannot prevent the decline in Hb due to hemodilution. The rest is due to a lack of knowledge about drinking the right iron supplement (Susanti et al., 2017; Sunuwar et al., 2019). In pregnant women who adhere to taking iron tablets but do not experience an increase in HB levels, it tends to be due to inadequate absorption in the body. This can occur when the mother is sick where the digestive system does not work optimally to absorb nutrients given to the body, including absorbing iron nutrients (McCormack and Drolet, 2012; Ghimire and Pandey, 2013; Putro et al., 2020a).

The Fisher exact test analysis results showed that the value of significance level $\alpha = 0.05$ was obtained; the value of $p = 0.001 < \alpha = 0.05$ ($p < \alpha$) was obtained. From this, it can be concluded that there is a correlation between nutritional intake and HB level of pregnant women at the location where this study was conducted. This supports the findings of previous studies, which indicate a strong correlation between nutritional intake and HB levels of pregnant women. The nutritional intake of pregnant women is beneficial for the growth and development of various fetal organs during pregnancy and helps metabolic processes (Ali et al., 2019; Mansyur et al., 2019). During pregnancy, a woman needs high Fe levels. It can even be said that there is a significant increase in the number of needs. Suppose the iron supply in the body is not sufficient. In that case, the iron in the body is insufficient or unable to meet HB synthesis's needs due to iron deficiency in food. Inadequate Fe intake will affect the HB production process and HB concentration in the blood, which can trigger the hemoglobin level's condition to drop (Sebtiarini et al., 2016; Darmawati et al., 2019).

This study has research limitations. This study uses an analytic method in the form of cross-sectional, in which it is known that the measurement process on the independent and dependent variables is

done simultaneously so that the cause and effect relationship cannot be explained.

CONCLUSION

There is a correlation between adherence to consuming iron supplements (or iron tablets) and the condition of iron nutrition intake with HB levels in pregnant women at the place where the study was conducted (Tanah Kalikedinding Health Care Center, Surabaya).

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EMPOWERING YOUTH IN CONTROLLING COVID-19 INFECTION AT THE IRMA AL-KAUTSAR MOSQUE SENOPATI HOUSING, CIKANDE, SERANG REGENCY

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ABSTRACT

Introduction: Since the WHO has stated that the COVID-19 is a pandemic, education and empowerment regarding COVID-19 in youths is needed. The purpose of this study is to explain the effect of providing online education on behavior and the process of empowering the youth of the Irma Al-Kautsar Mosque regarding the COVID-19 prevention protocol. **Method:** A mixed method was conducted in this study. Case study design was used for qualitative method and quasi-experimental design for quantitative. Total sampling was used on the population, which was youths aged 14-18 years (N=10). The data collection and retrieval techniques are group discussions and questionnaires about behavior. **Results:** The study showed that the group discussion resulted in three big themes, namely related to the COVID-19 prevention and education program, the needs of youth for education about COVID-19, and effective methods of disseminating COVID-19 information for youths. It showed a change in the frequency and percentage of behavior regarding COVID-19 and the prevention of infection in youths. The paired t-test showed that the knowledge domain had a significance value $p < 0.05$ and for the action and attitude domain was $p > 0.05$. **Conclusions:** There was a significant influence between providing education with knowledge improvement related to COVID-19 and prevention of infection among youth, while the attitudes and actions of youths were not significantly influenced by education intervention. Youth actively participated in empowerment activities for disseminating information related to COVID-19 on social media.

Keywords: COVID-19, education, empowerment, online, youth

INTRODUCTION

Coronaviruses are a group of viruses transmitted zoonoses (between animals and humans) and can cause mild to severe symptoms. Previously, there was a new type coronavirus known to cause disease in humans, Severe Acute Respiratory Syndrome (SARS-CoV) (Ministry of Health Indonesia, 2020). On 11 February, 2020, the WHO announced the official name of this new disease, namely as "COVID-19" (Coronavirus Disease 2019) which is listed in the International Classification of Diseases (ICD). COVID-19 infection in humans causes symptoms of acute respiratory distress such as fever, cough and out of breath. In severe cases, this disease can cause pneumonia, acute respiratory syndrome, kidney failure, and

even death. Symptoms of this disease can appear within 2-14 days after exposure to the virus (Ministry of Health Indonesia, 2020).

According to the Banten Province Corona Info, the incidence of COVID-19 cases in Banten Province has reached 13,339 confirmed cases and 395 deaths as of 29 November, 2020. It experienced a significant increase when compared to the number of first confirmed cases on 8 April, 2020, which reported 152 cases. According to Gugus Tugas Penanganan COVID-19 in Serang Regency, the incidence of COVID-19 cases has reached 922 confirmed cases and 27 deaths as of 29 November, 2020. In Cikande District, the incidence of COVID-19 cases has reached 104 confirmed cases and one death as of 29 November, 2020.

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The WHO recommends prevention by diligently washing hands with soap in flowing water, keeping a distance from people when talking, and not touching face with dirty hands. The WHO also prompts to wear the mask and cover the nose and mouth with a tissue or bent elbow when coughing (WHO, 2020).

Preventive actions should be carried out in line with the support of social media contributions as public education about COVID-19 during a pandemic. Through social media measures, it can be given to prevent infection with COVID-19 (Sampurno et al., 2020). Mass media communication, in this case, is social media, which is a fundamental component of many health promotion strategies designed to change health risk behavior (Alber et al., 2016).

The effort to provide knowledge to the broader community regarding action to prevent the spread of COVID-19 is through online education. Online education can support the learning process to become formal by using technology (Bower, 2019). Distance learning processes and methods have become a new habit that can provide summaries through a computer or smartphone screen (Fantini & Safari Tamba, 2020). To carry out research and empowerment during the COVID-19 pandemic, several researchers in Indonesia conducted research using technology, such as Zoom, WhatsApp, and social media such as Instagram and Facebook (Rahmayanti et al., 2020; Sugiyarto, 2020).

Youth at Al-Kautsar Mosque, Senopati Housing, Cikande, Serang Regency is one of the youth groups whose members can access social media and online media. According to the initial assessment interview, it is found that their behavior is still lacking in following health protocols. The reasons also vary, namely the low awareness of COVID-19 prevention, and feeling bored with complying with health protocols. Besides, it is found that these youths have never

received education about COVID-19 from a trusted source.

Not only do youths get information about COVID-19 prevention from online media and social media, but they also have the potential to spread the information they get about education from health workers, through these media. The results of the initial assessment also show that the Al-Kautsar Mosque Youth are interested in disseminating accurate information about COVID-19 through social media. Therefore, the information they get can reach other groups of youth.

METHOD

The research was a mixed method research that combined two forms of research approaches: case study design was used for qualitative method and quasi-experimental design for quantitative with a one-group pre-post survey approach. In this design, respondents were given educational interventions to the Irma Al-Kautsar Mosque Youth, Cikande, Serang Regency. The research sample was total sampling: ten respondents.

Data collection and retrieval techniques were group discussions and filling out questionnaires related to behavior. In the preparation stage, the study implementer determined the primary topic of the study, conducted literature and literature studies, and conducted an initial assessment of the Irma Al-Kautsar Mosque Youth. The data collection of the Irma Al-Kautsar Mosque Youth, aged 14-18 years, was conducted before the implementation stage. The data collection aimed to find out youths' readiness and willingness to carry out empowerment activities to prevent COVID-19.

The implementation phase of the youth empowerment study activity consisted of four activities: group discussion activities, providing education about COVID-19 and behaviors to prevent infection of COVID-19, training in making information media, and disseminating

information of COVID-19 media through social media. The activities were carried out from 8 December, 2020 to 31 December, 2020. All stages of the activity were carried out through online media.

Behavioral data on the prevention of COVID-19 infection was carried out twice, before and after educational activities, and using the same questionnaire. The evaluation of information dissemination activities was reported independently by the youth, accompanied by a study implementer through a self-report form. Data collection in this study was carried out using primary data sources through distributing questionnaires directly to respondents. The data collected were then processed in several stages.

Univariate data that had been collected using qualitative data were analyzed using four stages of analysis: transcripts of discussion results and self-reports, data reduction, data presentation, and providing conclusions. The processed quantitative data were analyzed using descriptive statistical analysis. The bivariate data analysis used the Paired T-test analysis test to test whether there were differences in knowledge, attitudes, and behavior due to COVID-19 prevention education in the Irma Al-Kautsar Mosque Youth. Data distribution was tested through Kolmogorov-Smirnov test. The result is shown in Table 2. The test provided a probability value (p-value), then compared to α value = 0.05 (95% confidence level).

The data used and all activities in this study were part of a final examination assignment in the Community Organizing and Development course. Due to that matter, funding support and ethical clearance for the article were not provided and required. However, the article fulfilled the ethics research stipulated in the World Medical Association.

The statement was confirmed by Dean of Faculty of Public Health University of Indonesia through a Letter of Confirmation Regarding Ethical Clearance

and Funding. The Letter Number is S-1815/UN2.F10.D/PDP.04.00/2021

RESULT

Respondents' Characteristics

The characteristics of the respondents identified in this study include demographic data, including gender, age, current education and occupation. Table 1 shows that gender composition was divided equally into men (50%) and women (50%). The education level of respondents was dominated by high school level (70%) and had never worked (90%). The average age of the Irma Al-Kautsar Mosque Youth who became the study respondents was 16.7 years old with a standard deviation of ± 1.494 or could be explained in the range 15.20 - 18.19 years.

Table 1. Demographics of the Irma Al-Kautsar Mosque Youth (N = 10)

Characteristics	f	(%)	Mean	SD
Gender				
Male	5	50		
Women	5	50		
Education				
Junior High School	2	20		
Senior High School	7	70		
College	1	10		
Occupation				
Not yet working	9	90		
Factory workers	1	10		
Age			16.7	1.49

Group Discussion Results Data

The results of the discussion of the Irma Al-Kautsar Mosque Youth group produced an overview of the knowledge and behavior of youths about COVID-19 and its infection prevention. The group discussion developed three major themes: the COVID-19 prevention and education program, the need for youth for education

about COVID-19, and methods for disseminating information on COVID-19 that were effective for youths.

On the theme of the COVID-19 prevention and education program, respondents stated that COVID-19 prevention programs such as using disinfection, staying at home, wearing masks, and washing hands in the respondent's environment only started at the beginning of the COVID-19 pandemic. Obedience to health protocols did not last long, for example, when youths and the public were asked to wear masks when going to the mosque, some even removed the masks when talking with others.

"... When the Covid-19 pandemic was announced, many people obeyed health protocols. But now it is no longer..." (Respondent 1)

Besides, respondents argue that youths' non-compliance with COVID-19 prevention protocols was caused by their low awareness of the dangers of COVID-19. Another reason was that respondents felt tired and uncomfortable when carrying out health protocols, especially wearing a mask.

"... In my opinion, people or friends feel tired of obeying to health protocols. Then, wearing a mask when talking is uncomfortable ..." (Respondent 3)

Respondents received information about COVID-19 through television and online information sources such as social media: Instagram and Facebook, and messenger applications: WhatsApp. Instagram was the source most used by respondents in accessing information about COVID-19. A lot of information about COVID-19 had been circulating, but the credibility was still doubtful.

"... Usually from Instagram, Facebook, television, WhatsApp group. But most often from Instagram..." (Respondent 2)

"... From people who can provide reliable health information ..." (Respondent 7)

Direct counseling or education, specifically regarding COVID-19, had never been carried out in the respondent's

environment. The information available was only an announcement by the mosque regarding an appeal to use masks.

"... It has not been. Sometimes there is information, but if someone provides counseling, it has never been done ..." (Respondent 6).

Respondents felt doubtful because some were afraid to convey inaccurate information, but they were enthusiastic if they were previously provided with information and education. Respondents stated that information about COVID-19 from peers could be accepted if reliable sources of information were included.

"... I am ready and enthusiastic to share knowledge but also hesitate because I am worried about conveying incorrect information ..." (Respondent 8)

"... it does not matter to me if I get education from peers as long as the information source is reliable and valid ..." (Respondent 10)

Youth Behavior Related to COVID-19 Infection Prevention

In the description of the Irma Al-Kautsar Mosque Youth Behavior on Prevention of COVID-19 Transmission before and after education on COVID-19 which explained the comparison, there was an increase in the average score in each domain of COVID-19 prevention behavior after education, except in the domain of action. Data results were normally distributed, as shown in Table 2.

The mean score of knowledge about COVID-19 and prevention of infection, both pre-test and post-test, were 10.5 and 12.2, respectively. The average score of attitudes toward COVID-19 and infection prevention, both pre-test and post-test were 20.9 and 22.8. The domains of action toward COVID-19 and infection prevention do not significantly differ in the pre-test and post-test sessions.

The distribution of the knowledge domain category of the Irma Al-Kautsar Mosque Youth about COVID-19 and prevention of infection before and after

education are shown in Table 3. The table shows an increase in frequency and percentage for knowledge about COVID-19 and prevention of infection in the high category before and after education.

Knowledge about COVID-19 and prevention of infection in the pre-test session was dominated by the low knowledge category (70%), while the post-test session was dominated by the high knowledge category (80%).

Table 3 shows the distribution of the attitude categories of the Irma Al-Kautsar

Mosque Youth about COVID-19 and the prevention of infection before and after education. The table explains a change in the frequency and percentage of attitudes about COVID-19 and the prevention of infection by youths in the positive attitude dominated by the negative attitude category (60%) category after education. COVID-19 and prevention of infection are attitudes about before the education was carried out; the attitude category was dominated by positive attitude (70%) after education.

Table 2. Distribution of Youth Behaviors Related to Prevention of COVID-19 Transmission (N = 10)

The Domain of Behavior in COVID-19 Prevention		Min	Max	Mean	SD	p-value*
Knowledge of COVID-19 and prevention of infection	Pre-Test	8	13	10.5	1.841	0.302
	Post-Test	10	14	12.20	1.229	0.319
Attitudes of COVID-19 and prevention of infection	Pre-Test	17	27	20.90	3.573	0.992
	Post-Test	17	27	22.80	3.994	0.486
Action of COVID-19 and prevention of infection	Pre-Test	21	34	27.40	3.777	0.295
	Post-Test	20	34	27.40	4.719	0.651

**)Kolmogorov-Smirnov Test: data are normally distributed if p-value > 0.05*

The distribution of healthy and unhealthy categories against COVID-19 and prevention of infection are shown in Table 3. The table shows changes in the frequency and percentage of actions regarding COVID-19 and prevention of infection in the category of healthy measures, before and after education.

The percentage of healthy action category before education was 20%, but after education, the percentage increased to 30%. The category of unhealthy actions still dominated both before education (80%) and after education (70%) but there was a decrease of 10%.

Table 3. The Behavior of the Irma Al-Kautsar Mosque Youth about COVID-19 and the Prevention of Infection (N = 10)

Variable	Pre Test		Post Test	
	n	%	n	%
Knowledge				
High	3	30	8	80
Low	7	70	2	20
Attitudes				
Positive	6	60	3	30

Variable	Pre Test		Post Test	
	n	%	n	%
Negative	4	40	7	70
Action				
Health	4	40	7	70
Not Health	6	60	3	30

The Impact of Education on Youth Behavior Related to Prevention of COVID-19 Infection

The effect of education on youth behavior related to the prevention of COVID-19 infection is presented in Table 4. The table presents that the average difference in the score of knowledge before and after education was 1.70 (\pm 2.263). The results of the paired T statistical test showed that the 2-Tailed significance value was 0.042 or $p < 0.05$. The conclusion was that there was a significant influence between providing education and increasing

knowledge about COVID-19 and preventing infection in the Irma Al-Kautsar Mosque Youth. The paired T statistical test results showed that the 2-Tailed significance value on the attitude and action variables respectively was 0.152 or $p < 0.05$ and 1,000 or $p > 0.05$.

The conclusion was that education can improve youth attitudes about COVID-19 and infection prevention behavior, but not significantly. Meanwhile, the actions of youths regarding COVID-19 and their infection prevention behavior were not significantly influenced by education.

Table 4. The Impact of Education on Youth Behavior Related to Prevention of COVID-19 Infection

Behavior of Prevention COVID-19 Infection	Post-Test – Pre-Test			
	Mean	SD	Std. Error Mean	Sig. (2-tailed)*
Knowledge of COVID-19 and prevention of infection	1.70	2.263	0.716	0.042
Attitudes of COVID-19 dan prevention of infection	1.90	3.843	1.215	0.152
Action of COVID-19 and prevention of infection	0.00	3.621	1.145	1.000

*)Confidence Interval: 95%. Significant if sig. (2-tailed) < 0.05

Self-Report Data on the Dissemination of COVID-19 Information by the Irma Al-Kautsar Mosque Youth

Respondents carrying out activities to disseminate COVID-19 information through social media were reported through self-report sheets. Table 5 shows the conclusions of the COVID-19 information dissemination activities by respondents. Respondents used the internet for an average of 9.25 hours (\pm 0.957) each day by spending an average internet quota of 20

GB (\pm 7,071). The most frequently used social media by respondents was Instagram, and the most used messenger application was WhatsApp.

The spread of COVID-19 information was carried out by respondents by uploading COVID-19 educational information on their social media. Respondents had uploaded information related to COVID-19 once in the past week since the task of disseminating the information was given. All respondents

used the respondent's personal Instagram as a medium to disseminate this information.

Educational information related to COVID-19 uploaded by respondents via social media was a poster containing information regarding the ethics of sneezing

and coughing in public places and myths and facts about COVID-19. The posters had been uploaded on social media for 1-2 weeks, counting from the time teenagers were assigned to disseminate information on COVID-19.

Table 5. The COVID-19 Information Dissemination Data by the Irma Al-Kautsar Mosque Youth (N = 10)

Activity	Youth Practice
The average amount of internet usage per day	9.25 hours (\pm 0.957)
Average quota spent on internet usage per month	20 GB (<i>gigabyte</i>) (\pm 7.071)
Most used social media	Instagram and WhatsApp
Frequency: In the past week, how many times have you posted COVID-19 prevention information on your Social Media?	I uploaded information on COVID-19 prevention on Social Media 1 time in the past week
Social Media: What types of Social Media are used to spread COVID-19 prevention information	I use Instagram to spread COVID-19 prevention information
Form of Information: State the form of the uploaded information, for example, narrative, illustration, video, then describe the contents of the information	<i>"I use poster media to spread information about how to prevent COVID-19 by implementing Sneezing and Coughing Ethics in public places."</i> <i>"The information uploaded is a poster containing information about the facts and myths of COVID-19."</i>
Duration: In the past week, how long has each of the uploaded COVID-19 prevention information been on your Social Media?	1-2 weeks

DISCUSSION

Respondents in this study are ten youths aged 14-18 years and most of them are still in high school. Santrock (2003) explains that youth is defined as a period of developmental transition from childhood to

adulthood, which includes aspects of biology, cognitive, and social changes that take place between the ages of 10-19 years.

Research conducted by Upadhyay and Lipkovich (2020) examines the appropriateness of using websites to recruit and conduct cognitive interviews toward

youths in the United States using Zoom. In this study, Zoom is also used as an interactive discussion with the Irma Al-Kautsar Mosque Youth to produce an overview of the knowledge and behavior of youths about COVID-19 and the prevention of infection.

Mosque youths get information about COVID-19 through television and online information sources such as social media: Instagram and Facebook, and messenger applications. It is in line with the research conducted by Novianti and Listyandini (2020) which aims to make youths active and informative and happy to be involved in this useful activity as well as using online applications such as WhatsApp and Zoom.

In the era of the COVID-19 pandemic, the online learning method is the best method recommended by the government for education to youths and people who are at the education level in general, and the internet has succeeded in influencing all groups including teenagers. Youths can be a vulnerable group because, if they are not supervised, they can fall into adverse effects, so positive things are needed in using the internet.

According to Adhikari (2017) in a study entitled "Utilization Of Online Social Media For Health Promotions Among Adolescents Of Nepa, most respondents (63.7%) have inadequate knowledge of online social media for health promotion and 31.1% of respondents have moderate knowledge. Only 5.2% have sufficient knowledge in the use of online social media for health promotion.

Moreover, research by Park and Kwon (2018) entitled "Health-Related Internet Use by Children and Adolescents: Systematic Review" explains how youths seek information and support systems for their healthcare on the internet. Several studies show that the level of physical vulnerability youths against COVID-19 is relatively the same or lower than adults. However, the symptoms of the disease to youths often do not appear, so that they have

a higher risk of spreading the disease (de Oliveira et al., 2020; Viner et al., 2020; Walger et al., 2020).

The youths' role in the infection and spread of COVID-19 in the community is still unclear (Viner et al., 2020). However, several assumptions arise that youths can infect and spread the disease through many group activities and poor personal hygiene behavior (Walger et al., 2020).

From the educational activities using the discourse method through Zoom, it is found that the knowledge of the Irma Al-Kautsar Mosque Youth about preventing the spread of COVID-19 had increased. In conclusion, there is a significant influence between providing education and increasing knowledge about COVID-19 and preventing infection in the Irma Al-Kautsar Mosque Youth.

It is in line with the research of Rahmayanti et al. (2020), which educated youths with the lecture and question and answer method using Zoom. The result was an increase in participants' understanding and ability to understand the material presented about maintaining health during the COVID-19 pandemic. Sariyani et al. (2020) found that educational methods using Google Meets are effective in increasing youth knowledge about reproductive health. Also, Febriyanti et al. (2020) state that education and discussion through Zoom can provide new information and raise awareness about nutritional issues during the COVID-19 pandemic.

Another research conducted by Sari and Efni (2020) also states that WhatsApp as a medium for discussion in learning has been proven effective in increasing youth knowledge from 50.2% to 85.5%. The same thing happened in Sugiyarto's (2020) research that health counseling through Zoom and WhatsApp groups to youth organizations increased knowledge of youth organizations from 73% to 95% after health education was carried out. Those showed that online health education activities are effective in increasing knowledge.

Based on the study results, the attitude category in the study is dominated by positive attitudes (70%). It is concluded that education can improve youth attitudes about COVID-19 and infection prevention behavior, but it is not significant. Meanwhile, the actions of youths regarding COVID-19 and their infection prevention behavior are not significantly influenced by education. It can be caused by many factors: the duration of the intervention, which is too short to measure and the small number of respondents which can bias the study results.

This research also provides education to the Irma Al-Kautsar Mosque Youth to improve COVID-19 prevention behavior in youths themselves. Besides, it also empowers youths to convey health messages that have been obtained to family and peers in various communication media directly or through online media and social media.

The empowerment can be carried out in four stages: problem identification, planning, implementation, and evaluation (Andrade et al., 2018; Effendy, 2015). Respondents not only receive education about COVID-19 prevention behavior but are also provided with a short training on making poster media using Canva. This activity is based on the background of the respondents' average internet usage of 9.25 hours per day, the most frequently used social media by respondents is Instagram and the most frequently used messenger application is WhatsApp.

As in the research of Andrade et al. (2018) which shows that social media can reach youth involvement in health education content, this research also shows that there is a respondent's involvement in spreading COVID-19 information to their family and peers by uploading COVID-19 educational information on the respondents' personal social media such as WhatsApp, Instagram, and Facebook status in the form of posters related to the ethics of sneezing and coughing in public places, and myths

and facts related to COVID-19 once a week since the education was given.

By involving youths in the dissemination of accurate information to debunk the myths and preventive behaviors of COVID-19, it will be beneficial not only for social media users who read messages shared by respondents but for youth respondents themselves. The benefit is in the form of satisfaction to explore the potential in create messages and share COVID-19 prevention information to more people using social media so that online technology is advantageous in providing education to youths and other social media users.

This study has several limitations. Attitudes and actions results related to COVID-19 transmission prevention were not significantly influenced by education. This can be due to many factors, such as the duration of the intervention that was too short to measure differences between the before and after education section. Furthermore, an insufficient number of respondents could bias the results of the study.

Other obstacles were found during the study process. The internet connection varies among audience and implementors so the communication and learning process did not run as properly as it should have. Several audiences experienced device error or unsupported devices, which disturbed the learning and empowering process.

CONCLUSION

The results of the study show that education to the Irma Al-Kautsar Mosque Youth in Serang Regency indicates that there is a significant influence between providing education and increasing knowledge. Meanwhile, the actions and attitude of youths about COVID-19 and their infection prevention behavior are not significantly influenced by the giving of education to the teenagers of the Irma Al-Kautsar Mosque.

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RELATIONSHIP OF THREE BASIC NEEDS BY MOTHER WITH GROWTH AND DEVELOPMENT OF CHILDREN AGE 3-5 YEARS IN MULYOREJO, SURABAYA

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ABSTRACT

Introduction: Fulfilling the basic needs of children (education, love and care) can influence the growth and development of children in a positive direction. This study was aimed to analyze the relationship between the patterns of education, love, and care given by mothers with the growth and development of children at 3-5 years in the Mulyorejo Sub-District, Surabaya. **Method:** This study was cross-sectional design with 72 children aged 3-5 years old as sample and selected using simple random sampling. The data were collected from primary sources by interviewing mothers of children about her knowledge and the pattern of education, love, and care, measuring children's anthropometry and interviewing Pre-Screening Questionnaire Test with children. The data were analyzed using the Spearman correlation test. **Result:** showed there was no relationship between education pattern ($p = 0.122$) and love pattern ($p = 0.56$) with child development. There was a correlation between consumption pattern (as a care pattern) of animal side dish with weight for age ($p = 0.041$; OR = -0.242), fruit consumption with weight for age ($p = 0.010$; OR = -0.301), and fruit consumption with weight for height ($p = 0.025$; OR = -0.264). **Conclusion:** Although there is no relationship between education and love patterns with child development, in the care pattern, the consumption pattern of animal and fruit side dishes is proven to be related to the growth of children.

Keywords: Education Pattern, Love Pattern, Care Pattern, Growth, Development

INTRODUCTION

Children's growth and development is a process of forming individuals physically and psychologically (Fristi, Indriati and Erwin, 2014). Growth is a quantitative change, namely an increase in the number and size of cells which will result in an increase in the size and weight of all or part of the cells, whereas development is a qualitative change in body functions that occur gradually from that level lowest to highest level through the process of maturity and study (Wong, 2009).

Children's growth can be seen based on nutritional status (Robertson et al., 2019). World Health Organization reports that 51 million children under five are wasted (7.5%) and another 151 million are stunted (22.2%) (World Health Organization, 2017). Data in Indonesia (2018) show that 17.7% of children under five still experience nutritional problems (Health Research and Development Agency, 2018). Apart from growth problems, developmental problems are also common. Approximately 16% of

children in Indonesia have developmental disorders, both nerves and brain (Probosiwi, Huriyati and Ismail, 2017). The growth and development of children can be influenced by several factors, for example family income, parents' education and nutritional knowledge, parents' occupation, parenting patterns (education, love, care), food availability, sanitation and infectious diseases. (Suhardjo, 2003; Baliwati, 2005; Supariasa, 2012; Soetjningsih and Ranuh, 2013).

Education patterns are activities to stimulate the basic abilities of child to be optimal (Arifah, Rahmawati and Dewi, 2013). The love pattern is giving love and affection by parents to provide a sense of security and comfort to their children (Soedjatmiko, 2009). The care pattern is the ability to take care, protect and educate children to achieve optimal physical growth and health status (Yogi, 2017). According to research by Adriani and Maria (2009), there is a relationship between care patterns such as nutrition, healthcare and housing; education patterns such as stimulation; and

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love patterns which are giving love to growth and development in toddlers in Gresik. (Adriani and Maria, 2009). For toddlers with nutritional status below the red line, the provision of basic needs by parents is related to their development (Arifah, 2013). Environmental exposure that does not support stimulation of child development as an education pattern in the first years of life can cause negative impacts in the later stages of life related to IQ, academic achievement, social behavior, and income. (Heckman and Masterov, 2007). Research on love patterns suggests that a mother's hug provides a sense of security and promotes child's growth and development, especially in regard to personality and emotionality (Gentzler, Ramsey and Black, 2015; Altschul, Lee and Gershoff, 2016). Nutritional deficiency from food as a care pattern can be a trigger factor for the decline in linear growth of children (Millward, 2017)

Mulyorejo is one of the areas with a high risk of malnutrition in children, even entering tenth place in Surabaya (Central Bureau of Statistics, 2016; Miranti and Purhadi, 2016). Therefore, based on the previous explanation, the researcher is interested in seeing the relationship between the patterns of education, love, and care given by mothers with the growth and development of children age 3-5 years in Mulyorejo, Surabaya.

METHODS

This study used a cross-sectional research design. Researchers observed and analyzed relationships giving patterns of three basic needs such as education, loving, and caring pattern done by the mother with growth and development in toddlers. The population in this study were all children aged 36-60 months in Mulyorejo Sub District Surabaya because children aged 36-60 months are in their most active period and already can communicate with other people, including their parents. So that it is easier to find out how parents hone children's

abilities and measure the growth and development of the children. Samples were taken using simple random sampling method and Lemeshow formula ($d = 0.05$; $p = 8.26\%$; $N = 185$), then it determined a sample size of 72 toddlers. The inclusion criteria included domicile in Mulyorejo in the past three months, willingness to be the study sample, not being sick during the study, being mainly cared for by the mother, living with the main family, and not receiving additional recovery food. And the exclusion criteria were respondents not willing to be interviewed, children under 36-60 aged and children who were sick during the study.

Data collection was carried out from August to September 2020 in the Mulyorejo Sub-District. Data on the characteristics of respondents that were observed included mother's age, mother's education, mother's knowledge, mother's occupation, father's occupation, family income, number of family members, number of children, gender of children, and age of children. The identified knowledge of mothers related to child nutrition, education, love and care patterns, were then grouped into good (7-10 score), moderate (4-6 score), and low levels (0-3 score).

The independent variables to be identified include the pattern of education, love, and mother care, while the dependent variable was the growth and development of the children. Education patterns are carried out to hone soft, motoric and language skills in children (Hidayat, 2007). The pattern of love can be seen from two aspects, namely the interaction of mother and child, and the role of parents (Soetjningsih and Ranuh, 2013). Both variables were obtained through the developed and modified questionnaire from other research questionnaires that also relate to education and love pattern of children and the validity of which has been tested. Education and love pattern classified into three categories; each has a different cut-off for education pattern, namely good (13-15 score), moderate (7-12 score), and low (1-6 score). While for love pattern it is

namely good (21-30 score), moderate (11-20 score), and low (1-10 score). One of the care patterns can be seen through the consumption patterns of children identified using the Food Frequency Questionnaire, then divided into often (score > mean) and rare (score < mean) categories for each type of food (Arifah, 2013). Characteristics and three basic needs questionnaire were asked to mother's children.

Child development is identified using the Developmental Pre-Screening Questionnaire which will be categorized into three, namely appropriate (9-10 answered yes), confuse (7-8 answered yes), and irrelevance (<6 answered yes) (Department of Health, 2010). Children's growth is seen through three indicators, namely weight / age, height / age, and weight / height. Measurement of children's anthropometry (weight and height) was carried out directly by the researcher herself using calibrated digital bathroom scale and microtoise. For children's weight measurement, it is done by asking children to stand on a digital scale without footwear and then repeated twice. While for height measurement, it is done by asking the children to stand with their back under the microtoise then pulling down the microtoise mounted on the wall 2 meters high to the surface of the children's head. Analysis used SPSS ver. 21.0 and the Spearman

Correlation test with a significance value of $P < 0.05$. The implementation of this research has received a certificate of research ethics by Universitas Airlangga Faculty Of Dental Medicine Health Research Ethical Clearance Commission with Number 307/HRECC.FODM/VI/2020.

RESULTS

Characteristics of mothers as respondent and information about family can be seen in Table 1. Half of children's mothers were 20-30 years old (50%) with an average of 31.4 ± 6.29 years. Most of the respondents also graduated from senior high school (40.2%) with a moderate level of knowledge (61.1%). Only five mothers are college graduates. The majority of mothers do not work (79.2%), while the majority of fathers are private employees (81.9%). Only a quarter of the respondent's families earn more than the minimum wage, the rest is less. The average income of respondents is $\text{IDR } 3,129,166 \pm 1,796,353$. Most of the respondents had no more than two children (73.6%) with the highest total of family members not more than four (55.6%). The number of boys and girls was not too different (55.6 vs 44.4) with the lowest number at 42-47 months (13.8%) and the average age is 47.4 ± 8.33 month.

Table 1. Characteristics of Respondents

Variable	n	%
Mother's Age (years)		
20-30	36	50
31-40	32	44.4
41-50	4	5.56
Mother's Education		
None	1	1.4
Elementary school and equivalent	14	19.4
Junior high school and equivalent	23	31.9
Senior high school and equivalent	29	40.2
Diploma/Bachelor and equivalent	5	7
Mother's Knowledge level		
Good	25	34.7
Moderate	44	61.1

Variable	n	%
Low	3	4.2
Mother's Occupation		
None	57	79.2
Merchant or Entrepreneur	4	5.6
Private employees	10	13.9
Government employees	1	1.4
Father's Occupation		
None	0	0
Merchant or Entrepreneur	13	18.1
Private employees	59	81.9
Government employees	0	0
Family's income		
< minimum wage (Surabaya min. wage Rp4.200.000)	54	75
≥ minimum wage (Surabaya min. wage Rp4.200.000)	18	25
Number of family members at home (persons)		
≤ 4	40	55.6
5 – 6	25	34.7
> 6	7	9.7
Total of children		
≤ 2	53	73.6
3 – 4	18	25
> 4	1	1.4
Gender of children		
Boys	40	55.6
Girls	32	44.4
Age of children (month)		
36 – 41	23	31.9
42 – 47	10	13.8
48 – 53	18	25
54 – 60	21	29.2

The basic needs of children are obtained from the parenting style which includes education, love, and care pattern (Table 2). The education and love patterns performed by mothers are divided into three categories, namely good, moderate and low. In this study it is known that both education (94.4%) and love pattern (93.1%) of respondents are in good level, and the rest had moderate levels of education pattern (5.5%) and love pattern (6.9%), there are none in the low category. Based on the results of interviews with mothers of children, the form of education patterns are such as chatting with children, accompanying children play and always responding to children's words. While the

form of love pattern is such as always giving understanding and explanation to children when they are fussy, always there when the child needs something and always supporting and giving appreciation when children achieve something.

Interacting and playing together with children is good for honing motor skills and thinking ability of children, but, based on research, most parents only provided toys that can hone children's motor skills. There were some parents who still didn't use educational toys such as posters / picture cards, story books, puzzle toys and other toys that can help improve speaking and language skills in children.

Table 2. Three Basic Needs by Mother to Child

Variable	n	%
Education pattern level		
Good (score of 13-15)	68	94.4
Moderate (score of (7-12)	4	5.5
Low (score of 1-6)	0	0
Love pattern level		
Good (score of 21-30)	67	93.1
Moderate (score of 11-20)	5	6.9
Low (score of 1-10)	0	0
Care pattern of consumption		
Staple food		
Often (> mean)	44	61.1
Rarely (< mean)	28	38.9
Animal side dish		
Often (> mean)	34	47.2
Rarely (< mean)	38	52.8
Vegetable side dish		
Often (> mean)	35	48.6
Rarely (< mean)	37	51.4
Vegetables		
Often (> mean)	31	43.1
Rarely (< mean)	41	56.9
Fruits		
Often (> mean)	38	52.8
Rarely (< mean)	34	47.2
Milk and processed		
Often (> mean)	39	54.2
Rarely (< mean)	33	45.8
Others		
Often (> mean)	27	37.5
Rarely (< mean)	45	62.5

Different from the education and love pattern, care pattern is seen from the consumption pattern of children and there are only two categories, namely often and rarely. Based on the results of interview using the Food Frequency Questionnaire (FFQ) the types of food that are consumed frequently by children are staple food, fruits, milk, and processed, while animal side dish, vegetable side dish, vegetables, and others are classified as rarely consumed. Staple food which is most often consumed by children are rice, animal side dishes are egg and chicken, vegetable side dishes are tofu, vegetables are carrot, fruits are banana and melon, milk and processed products often

consumed are formula milk or UHT milk, and then the other foods that are often consumed are namely snacks.

Based on the researcher's observation, the environmental condition of the respondent's houses was not in accordance with the criteria for housing hygiene and sanitation. This is because the conditions around the respondent's houses are quite slum and narrow, so the access is not easy. The ventilation and lighting of the respondent's houses are also quite lacking. This can affect the health and nutritional status of children who live in those houses and also will affect their growth and development.

Table 3. Growth and Development of Children

Variable	n	%
Weight for Age		
Severe underweight	3	4.2
Underweight	13	18.1
Normal	45	62.5
Risk of overweight	11	15.3
Height for Age		
Severe stunting	3	4.2
Stunting	10	13.9
Normal	57	72.9
High	2	2.8
Weight for Height		
Severe wasting	2	2.8
Wasting	10	13.9
Normal	46	63.9
Risk of overweight	7	9.7
Overweight	2	2.8
Obese	5	6.9
Development of children		
Appropriate (score 9-10)	18	25
Confuse (score 7-8)	25	34.7
Irrelevance (score <6)	29	40.2

Table 3 shows the growth and development of children. Overall, most of the respondents had normal nutritional status. However, not a few respondents also experienced malnutrition or excess problems. Nutritional status based on weight / age shows that the number of respondents with underweight (22.3%) is more than those at risk of being overweight (15.3%). This is in contrast to the weight / height indicator which shows that the amount of wasting (16.7%) is slightly lower than the amount above normal (19.4%). If the growth

of children is seen from the nutritional status, most of them show normal conditions, different from the conditions of children's development. Most of the children received a score <6 which indicates developmental irrelevance. In this study, it is known that motor and sensory development in most children are good enough, but for speech and language it is still lacking because there are still quite a lot of children who find it difficult to carry out orders on the Developmental Pre-Screening Questionnaire Test.

Table 4. Relationship of Education and Love Pattern with Children's Development Level

Variable	Development of Children						p-value	OR
	Appropriate		Confuse		Irrelevance			
	n	%	n	%	n	%		
Education pattern								
Good	18	25	24	33.3	26	36.1	0,122	0.184
Moderate	0	0	1	1.4	3	4.2		
Low	0	0	0	0	0	0		
Love pattern								
Good	18	25	24	33.3	25	34.7	0,056	0.226
Moderate	0	0	1	1.4	4	5.6		

Variable	Development of Children						p-value	OR
	Appropriate		Confuse		Irrelevance			
	n	%	n	%	n	%		
Low	0	0	0	0	0	0		

Table 5. Relationship of Care Pattern with Toddler's Growth Level

Indicator of Nutritional Status	OR						
	Staple food	Animal side dish	Vegetable side dish	Vegetables	Fruits	Milk and processed	Others
Weight for age	-0.013	-0.242*	0.002	-0.085	-0.301*	-0.130	-0.177
Height for age	-0.168	0.051	-0.059	-0.057	-0.193	-0.062	-0.003
Weight for height	0.056	-0.197	0.020	-0.093	-0.264*	-0.072	-0.156

*significance <0.05

The relationship between education and love patterns with child development can be seen in Table 4. Between the two variables, there was no relationship with the development of children ($p = 0.122$ and $p = 0.056$). The relationship between care patterns and child growth is shown in Table 5. There was no correlation between consumption patterns and height for age. However, it was found that there was a relationship between the consumption patterns of animal side dishes ($p = 0.041$; OR = -0.242) and fruits ($p = 0.010$; OR = -0.301) and the indicator of weight for age. The pattern of fruit consumption was also known to have relationship with the growth (weight for height) for children ($p = 0.025$; OR = -0.264).

DISCUSSION

Respondents' Characteristics

The characteristics of the parents can influence the growth and development of the child (Mitchell et al., 2013). Level of mother's education greatly affects the quality of child development (Abuya, Ciera and Kimani-Murage, 2012). According to Dessie et al. (2019), the higher the mother's education will increase her ability to absorb information and apply a positive parenting

style to the child (Dessie et al., 2019). In fact, according to Gimenez-Nadal and Molina (2013), father's education is less influential on children than mothers. In line with the educational level, most of the mothers are senior high school graduates, the majority of mothers' knowledge of three basic needs for children is also at a moderate level. The mother acts as the first educator in the child's growth and development, so that knowledge is very important in order to provide positive information to the child (Cahyanti and Zulaikha, 2020).

Most fathers work as private employees and mothers as housewife. The type of work can affect family income and free time provided, especially by mothers, for children (Milkie et al., 2010; Noble et al., 2015). The less free time parents have, the less interaction and stimulation the child has (Arifah, 2013). The economic condition of respondents was classified as low because most of them have income less than the minimum wage (75%). Economic conditions affect the ability to buy family's daily needs, one of which is nutritious food, which can affect the patterns and variations of children's eating (Bekelman, Bellows and Johnson, 2017). A longitudinal study reports that families with low income are more at risk of experiencing malnutrition, such as

overweight and obese as the child grows (Demment, Haas and Olson, 2014). The large number of children in the family can influence the focus of mother's attention in caring for her children (Nurapriyanti, Sarwinanti and Satriandari, 2016). Families with low economic status and having many children result in a lack of attention, affection, and also the provision of primary needs such as food to be more limited. Thus, it can affect children's growth and development to be less than optimal. (Hidayah, 2010).

Education Pattern in Toddler Development

This study shows no relationship between education patterns and child development. The majority of children experience irrelevant development despite getting a good education pattern from their mothers. This may be due to other environmental factors that affect child development. According to Hawa and Spanoudis (2014), children's development can be influenced by intrinsic and extrinsic factors including heritability, communicative interaction with parents, parental stress, and family socioeconomic status. Even sleep regulation can also affect child development (Bathory and Tomopoulos, 2017). Based on the Developmental Pre-Screening Questionnaire, it is known that the motor and movement development of toddlers is quite good, but speech and language development is still lacking. Mothers of children often interact with toddlers, but without using tools that can support the child's vocabulary increase.

The results of this study are different from research by Hidayah (2010) which shows a relationship between stimulation and toddler development. The more frequent interactions that are carried out by the mother, the children's abilities will increase and their development will increase (Lestari, 2019). The cluster-randomized field trial research showed that learning programs that focus on modeling and practice can

improve good stimulation for language development in children. (Aboud and Akhter, 2011). The stimulating effect of mothers, even with low education, was proven to be 1.7 times more effective on child development (Barros et al., 2010).

Love Pattern in Toddler Development

During the study, quite a number of children were still shy, lacking confidence and fussy because they were afraid to interact with other people, especially with researchers. This can be caused by several factors, including mothers who do not give their children time to learn independently in playing activities and do not teach socialization with the environment. (Ruauw, Rompas and Gannika, 2019). According to Liao (2012), children need to be loved. Every child needs affection, which can have an impact on the child's physical and mental development (Wall, 2018). Children who grow up with warm affection from their parents have a higher sensitivity to surroundings (Adriani and Maria, 2009). Among the disorders caused by abnormal development are psychosocial and behavioral disorders, for example the child becomes irritable and difficult to manage (Ruauw, Rompas and Gannika, 2019).

Care Pattern in Toddler Growth

One of the ways to identify care patterns is through consumption patterns. Children in the study mostly ate staple foods. Research by Stevens and Nelson (2011) reports that children with low income families tend to consume lots of food sources of carbohydrates, fats and oils .

Based on the results of the Spearman correlation test between consumption patterns and nutritional status of body weight for age, it was found that there was a significant relationship between consumption of animal side dishes (OR = -0,242) and consumption of fruit (-0,301) with the nutritional status of children's weight for age. This means that the two variables have a strong but unidirectional

relationship. The results showed that most children who often consume animal side dishes tend to have normal nutritional status according to the weight for age index (33.3%). However, there were also children who had a risk of over nutrition (11.1%). According to Ardhyati (2015) regarding the relationship between animal food and the nutritional status of elementary school children in Sukoharjo, the more types of animal food are consumed, the better the child's nutritional status is. Even though the consumption of animal side dishes is needed by the body, the amount needs to be limited, because the cholesterol and saturated fat content is higher than vegetable side dishes, which can lead to obesity. (Triandhini, Kinasih and Sriwijayanti, 2018). Rachmi et al. (2016) explained that. in Indonesia, the prevalence rate of stunting and underweight has decreased in children aged 3-5 years. However, the number of "at risk," overweight, and obese have increased (Rachmi et al., 2016).

Similar to the weight for age indicator, fruit consumption patterns were also shown to be associated with child growth (OR = -0.264). The coefficient correlation shows a strong enough relationship, but not in the same direction. So, the more often children consume fruit, then their nutritional status tends to be normal. Consuming adequate amounts of fruit can prevent obesity, because fruit is rich in fiber which contains relatively low energy and calories, and creates a feeling of fullness longer so it can reduce hunger but does not cause fat (Nepper and Chai, 2017). In addition, fruit also contains vitamins, minerals and antioxidants that are useful to immune system or keeping the body's defense system from free radicals (Wang et al., 2011). Low consumption of fruit can cause constipation and in the long run can cause various diseases such as cardiovascular disease, stroke, obesity, diabetes mellitus, colon cancer and dyslipidemia (Damayanti, Murbawani and Fitrianti, 2018).

CONCLUSION

Children's development can be influenced by many factors. Although there has not been found a relationship between education and love patterns with children's development, the practice of these two variables is believed to optimally influence the improvement of child's development. On the other hand, a relationship was found between consumption patterns and children's growth, especially consumption of animal side dishes and fruit. Children's mothers need to provide regular stimulation to their child as well as a more varied diet to support optimal development and growth.

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CORRELATION OF PREDISPOSING, ENABLING, AND NEED FACTOR OF PROGRAM KELUARGA HARAPAN PARTICIPANTS TOWARD UTILIZING PRIMARY HEALTHCARE

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ABSTRACT

Introduction: Program Keluarga Harapan (PKH) is a program aimed to reduce the vulnerability of the poor through conditional cash assistance for household need such as access to health and education services, immunization, and family nutrition fulfillment. PKH participants are given health insurance (KIS) facility, especially in Penerima Bantuan Iuran (PBI), to access health services. Total PBI participants in 2019 reached 28.81% with healthcare utilization only 13.34%. Preliminary studies showed that not all PKH participants have KIS and use health services. The aim of the study is to find out the correlation of predisposing, enabling, and need factors of PKH participants in the Thematic Village toward utilizing health services in Kendalkerep Primary Healthcare. **Methods:** This study is an analytic-observational study and cross-sectional approach with subjects all of PKH participants in Kampoeng Lampung Wangi, Kampung Warna Warni Jodipan, and Kampung Tridi. Data are analyzed by logistic regression and correlational test. **Result:** Results of analysis show that there is significant correlations of predisposing factor such as education ($\beta = 1.689$), employment status ($\beta = 1.466$); enabling factor such as health insurance ($\beta = 3.045$), access to healthcare ($\beta = 2.819$); and need is a perception of illness ($\beta = 2.767$) toward Kendalkerep Primary Healthcare by PKH Thematic Village participants. **Conclusion:** Based on Nagelkerke determination coefficient, health insurance and access is a dominant factor which affects the utilization Kendalkerep Primary Healthcare of 46% with correlational strength fair and correlational direction positive.

Keywords: Program Keluarga Harapan; health insurance; access to healthcare; healthcare utilization.

INTRODUCTION

Poverty is a condition of inability to fulfill basic needs such as clothing, food, and shelter. The number of poor people in Indonesia on September 2019 reached 24.78 million (9.22%) and 4 million (10.2%) in East Java (Central Bureau of Statistics, 2016). Program Keluarga Harapan (PKH) is a program aimed to reduce the vulnerability of the poor through conditional cash assistance for household need such as access to health and education services, immunization, and family nutrition fulfillment (WHO, 2019). PKH participants are given health insurance (KIS) facility, especially in Penerima Bantuan Iuran (PBI), to access health services. The last three years

percentage of PBI participants in East Java has increased from 24.7% (2017) to 27.1% (2018) and 28.81% (2019), but the healthcare utilization is not more than 65%, namely 12.8% (2017), 13.33% (2018) and 13.34% (2019) (Noviani and Agustina, 2019).

The population density in Malang City reached 8,718 people/km² in 2019 (Central Bureau of Statistics of Malang City, 2019). Jodipan has the second largest population density in the Malang City with 23,947 people/km² and Kesatrian with 7,570 people/km². High population density in an area can increase the number of unemployment and poverty, which has an impact on decrease of public health (Central Bureau of Statistics of Malang City, 2020). Poverty is related with slum

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environmental conditions so their socioeconomics and public health become bad (Directorate General of Creation of The Ministry of Public Works, 2016).

Kampoeng Lampion Wangi and Kampung Warna Warni Jodipan are located in Jodipan, meanwhile Kampung Tridi is located in Kesatrian. They are Thematic Villages as a slum settlement solution in Malang City (Wulandari, 2017). Preliminary studies showed that not all PKH participants have KIS and use health services, which is Kendalkerep Primary Healthcare as a first level health facility which cover all three Thematic Villages. Visiting data of PBI participants in Kendalkerep Primary Healthcare during June–August 2020 show that there is decreased utilization of healthcare facility from 1m,724 people in June 2020, 1, 460 people in July 2020 and 1,161 people in August 2020.

Andersen and Newman (2005) explain that individual characteristics can influence healthcare utilization such as predisposing, enabling, and need factor. Andersen Behavioral Model's framework assumes that each factor contributes to the healthcare utilization in sequence, starting with predisposing factor which is individual use of health service (predisposing factor) and then the ability to access health service until the occurrence of health needs (Andersen, 2005). Predisposing factor explains individual socioeconomic condition which determines healthcare utilization, such as age, sex, education, employment status, marital status, ethnic, family size, culture, religion, and social interaction (Başar, Öztürk and Cakmak, 2018). Enabling factor explains individual or family ability to use healthcare services such as access, salary, health insurance, shelter, and price of healthcare service (Sutter, 2017). Need is a direct cause of healthcare utilization (Alhamda, 2014) which is divided into two, perceived need and evaluated need (Başar et al., 2018).

Based on backgrounds, the aim of study was to find out the correlation of predisposing, enabling, and need factor among PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare.

METHODS

This study is an analytic-observational study with cross-sectional design. The study was implemented in three Thematic Villages, Kampoeng Lampion Wangi, Kampung Warna Warni Jodipan, and Kampung Tridi, in November–December 2020. Population of the study is all of Program Keluarga Harapan (PKH) participants in the Thematic Villages. This study engaged 52 families including 13 PKH families in Kampoeng Lampion Wangi, 14 PKH families in Kampung Warna Warni Jodipan, and 25 PKH families in Kampung Tridi. This study passed the ethics of conduct from the Health Research Ethics Committee, State Polytechnic of Health Malang No: 001/KEPK-POLKESMA/2020.

Independent variables are age (X_1), sex (X_2), education (X_3), employment status (X_4), salary (X_5), health insurance (X_6), access (X_7), and perception of illness (X_8). Dependent variable is healthcare utilization in Kendalkerep Primary Healthcare during the last six months (Y).

Data collection was using the questionnaire to respondents to find out healthcare utilization based on individual characteristics with a total 19 questions. The questionnaire passed the validity with *r table* value was 0.3550 and reliability test with Cronbach's alpha value ≥ 0.6 . Bivariate and multivariate data were analyzed by regression logistic test to explain correlation of independent and dependent variables ($\alpha = 0.05$). Correlational test was analyzed by Spearman's rho which explains correlation strength and direction of independent variables to dependent variable.

RESULTS

characteristics toward healthcare utilization in Kendalkerep Primary Healthcare.

Data analysis show that frequency distribution and correlation of individual

Table 1. Characteristics of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Characteristics	n	%
Age		
< 60 years	40	76.9
≥ 60 years	12	23.1
Sex		
Male	2	3.8
Female	50	96.2
Education		
Low (≤ Junior High School)	29	55.8
High (> Junior High School)	23	44.2
Employment Status		
Employed	32	61.5
Not employed	20	38.5
Salary (Based on Poverty Line Malang City/People/Month)		
≤ 543.966,00	42	80.8
> 543.966,00	10	19.2
Health Insurance		
KIS	45	86.5
Another health insurance	7	13.5
Access to Healthcare		
Easy to access	32	61.5
Hard to access	30	38.5
Perception of Illness		
Known	46	88.5
Unknown	6	11.5

Table 1 shows the characteristics of PKH participants in Thematic Villages toward utilizing Kendalkerep Primary Healthcare. Age of PKH participants in three Thematic Villages is dominated by age < 60 years group with percentage 76.9% and 23.1% are ≥ 60 years group. Sex is dominated by 50 females and only two males as PKH participants. Level of education PKH participants are dominated by low education with 55.8% and the other 44.2% has high education. Low education means that the maximum education taken is junior high school, meanwhile high education means that the minimum education taken is senior high school. Employment status shows that 55.8% PKH

participants are employed and 44.2% are not employed.

Salary of PKH participants in one month shows that 80.8% of respondents have salary below poverty line in Malang City and 19.2% respondents have salary above poverty line in Malang City. Based on ownership of health insurance, only 45 families of PKH participants have KIS and seven families have another health insurance. Based on the table, we know that 61.5% of respondents choose to have easy access and 38.5% respondents choose to have hard access. Knowledge of PKH participants about perception of illness shows that 88.5% respondents know about perception of illness through questions

including sick definition; action when sick; and healthcare service needs, meanwhile

11.5% respondents don't know about perception of illness.

Table 2. Correlation of Predisposing, Enabling, and Need Factors of PKH Participants toward Utilizing Kendalkerep Primary Healthcare in 2020

Variable	Nagelkerke	β	Exp(β)	r*
Age (X ₁)	0.068	-1.099	0.333	-0.228
Sex (X ₂)	0.040	-20.449	0.000	-0.113
Education (X ₃)	0.165	1.689	5.417	0.342
Employment status (X ₄)	0.144	1.466	4.333	0.329
Salary (X ₅)	0.054	-1.036	0.355	-0.203
Health insurance (X ₆)	0.264	3.045	21.000	0.470
Access to healthcare (X ₇)	0.291	2.819	16.765	0.441
Perception of illness (X ₈)	0.205	2.767	15.909	0.411

*Spearman's rho

Table 2 shows that there are two variables of predisposing factor having significant correlation toward healthcare utilization in Kendalkerep Primary Healthcare by PKH participants; one is education ($\beta = 1.689$) and the other is employment status ($\beta = 1.466$). On enabling factor there are two variables having significant correlation toward utilizing Kendalkerep Primary Healthcare; one is health insurance ($\beta = 3.045$) and the other is access to healthcare ($\beta = 2.819$). Need as perception of illness has significant correlation toward utilizing Kendalkerep Primary Healthcare ($\beta = 2.767$).

Based on data, enabling factor has the highest significant correlation toward utilizing Kendalkerep Primary Healthcare. Health insurance has Nagelkerke determination coefficient as much as 0.264 which means the ability of independent variable "health insurance" to explain the dependent variable as much as 0.264 or 26.4%. The (+) sign on β value shows that there is positive correlation, which means the higher the health insurance ownership so the healthcare utilization will increase and vice versa. The influence magnitude of health insurance variable is shown as Exp(β) value as much as 21, which means PKH participants in Thematic Village with

health insurance have a tendency to use Kendalkerep Primary Healthcare as much as 21 times more than PKH participants who don't have health insurance. Coefficient of arithmetic correlation (r) is 0.470 times bigger than the correlation table value (r) as much as 0.2732 in significant (α) 5%, which means there is a fair correlation between health insurance toward healthcare utilization.

Access to healthcare has Nagelkerke determination coefficient as much as 0.291 which means the ability of independent variable "access to healthcare" to explain the dependent variable as much as 0.291 or 29.1%. The (+) sign on β value shows that there is a positive correlation, which means the easier the access so the healthcare utilization will increase and vice versa. The influence magnitude is shown as Exp(β) value as much as 16.7, which means PKH participants in Thematic Village who have easy access have a tendency to use Kendalkerep Primary Healthcare and is 16.7 times bigger than PKH participants in Thematic Village with hard access. Coefficient of arithmetic correlation (r) is 0.441 bigger than correlation table value on significance level (α) 5%, which means there is a fair correlation of health insurance toward healthcare utilization.

Table 3. Dominant Variable of Healthcare Utilization toward Utilizing Kendalkerep Primary Healthcare

Variable	Nagelkerke	β_0	B	Exp(β)	r*
Health insurance (X ₆)			3.147	23.261	0.470
Access to healthcare (X ₇)	0.460	-2.582	2.897	18.112	0.441

*Spearman's rho

Table 3 shows that there are two variables in healthcare utilization having significant correlation toward healthcare utilization in Kendalkerep Primary Healthcare by PKH participants, which are health insurance ($\beta = 3.147$) and access to healthcare ($\beta = 2.897$). Nagelkerke determination coefficient of both variables is as much as 0,460, which means the ability of the independent variable "health insurance and access to healthcare" to explain dependent variable is as much as 0.46 or 46%.

The (+) sign on β_6 and β_7 value shows that there is positive correlation, which means the bigger health insurance ownership and the easier access so the health utilization will increase and vice versa. Dominant variable is shown as Exp(β) value for health insurance as much as 23.2, which means PKH participants in Thematic Village who have KIS have tendency to use Kendalkerep Primary Healthcare 23,2 times higher than PKH participants in Thematic Village without KIS. Meanwhile, Exp(β) value for access is 18.1. Coefficients of arithmetic correlation for both variables are 0.470 (X₆) and 0.441 (X₇) higher than table correlation as much as 0.2732 on a significant level (α) 5%, which means there is a fair joint correlation of health insurance and access toward healthcare utilization.

DISCUSSION

Correlation of Age of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Age becomes one of important component in predisposing factor to show healthcare utilization needs. Bird,

Shugarman and Lynn (2002) explain that as you get older the utilization of health facilities gets sharper. The high utilization of health services in old age is due to the decreasing of people's physical resistance, making everyone more susceptible to disease exposure (Logen, Balqis and Darmawansyah, 2015).

Based on results known, there is no significant correlation between age of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction negative and correlation strength weak, which means that with the higher age of PKH participants in Thematic Village so the healthcare utilization will decrease and vice versa. The results are not in line with study from Irawan and Ainy (2018) showing that there is significant correlation between age of health insurance participants with healthcare utilization. The results show that getting older makes health condition to be more noticed, because many people still have status as a worker who must fulfil family needs.

Correlation of Sex of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Sex becomes one of the important components in predisposing factors which can influence everyone to utilize healthcare. Sex has a relationship with healthcare utilization because there are biological differences between male and female. Male uses fewer health services than female, because there is reproduction needs, so she more susceptible to disease and more active to deliver their child to

visit to healthcare services (Girma, Jira and Girma, 2011).

Based on results known, there is no significant correlation between sex of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction negative and correlation strength very weak, which means the higher sex difference of PKH participants in Thematic Village so the healthcare utilization will decrease and vice versa. The results are not in line with study from Girma, Jira and Girma (2011) which explain that there is significant correlation between sex toward healthcare utilization in Jimma South West Ethiopia with opportunity reaching 0.23 times. A case study in Indonesia conducted by Irawan and Ainy (2018) showed that there is significant correlation between sex toward healthcare utilization with opportunity reaching 1.8 times.

Correlation of Education of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Education becomes one of the important components in predisposing factors which can influence healthcare utilization. Level of education has a relationship with healthcare utilization because those with higher education are expected to be more cautious than people with low education. Therefore, people with high education are able to understand the importance of maintaining personal health and of those around them (Irawan and Ainy, 2018) so they will affect everyone to use available health services (Rabbaniyah and Nadjib, 2019).

The statement is supported by results of correlation analytic of education toward utilization healthcare in Kendalkerep Primary Healthcare; it is known there is significant correlation between education of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction positive and correlation strength weak,

which means the higher education of PKH participants in Thematic Village, so utilizing Kendalkerep Primary Healthcare will increase and vice versa. The results are in line with study from Purbantari, Roesdiyanto and Ulfah (2019) explaining that there is significant correlation between education toward healthcare utilization by tuberculosis sufferers in Janti Primary Healthcare. This study shows that dominant respondents have minimum level education as diploma and bachelor with utilization category good. It has an impact to knowledge about the medical consequences if health utilization is not routinely carried out.

Correlation of Employment Status of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Employment becomes one of the socioeconomic factors which can influence healthcare utilization. Work environment is a potential place which can influence health workers' condition, because work environment can explain risk of disease for their workers (Logen, Balqis and Darmawansyah, 2015). Therefore, people with employment have to be more active to use health services (Hidana, Shaputra and Maryati, 2018). The statement is supported by results of correlation analytic of employment status of PKH participants in Thematic Village toward utilization of healthcare facility in Kendalkerep Primary Healthcare. It is known there is a significant correlation between employment status of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction positive and correlation strength i weak. The results are in line with Rabbaniyah and Nadjib (2019) whose study shows that there is correlation between employment status with healthcare utilization for outpatients in West Java. This study explains that people with employment have tendency use health

services, because they have ability to pay healthcare utilization needs.

Correlation of Salary of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Healthcare utilization can be known through enabling factors, which refers to family ability to access health services such as salary, health insurance, access, shelter, and price of health services (Başar, Öztürk and Cakmak, 2018). Salary is one of the enabling factors having a relationship to selected health services by a family.

Engel's Laws of Consumption explain that salary and food have elasticity value between 0 and 1, known as inelasticity demand, which is identical with primary needs fulfillment (Fajar, 2017). Households with low salary will expend much money for primary needs fulfillment and vice versa households with high salary will expend less money for primary needs fulfillment (Irawan and Ainy, 2018). Salary can show degree of public health, because higher salary makes healthcare utilization be better (Logen, Balqis and Darmawansyah, 2015).

Based on results known, there is no significant correlation between salary of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction negative and correlation strength weak, which means the higher the salary so the healthcare utilization will decrease. The results are not line with study from Napirah dkk. (2016) which explains that there is a relationship between family salary with healthcare utilization in Tambarana Primary Healthcare. This study explains that respondents know how the way to get health services with good quality is by paying. Besides, the researcher also explains that respondent rates about free healthcare utilization that is not good so the impact in healthcare utilization becomes low.

Correlation of Health Insurance of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Health insurance ownership is one of the enabling factors which can influence everyone for the health service which is desired. Djunawan (2019) explains that economic status relates with healthcare utilization, because the poorest have limited healthcare utilization. Health insurance becomes an important factor for everyone because it can cover their health expenditure if getting sick (Logen, Balqis and Darmawansyah, 2015). Masita, Yuniar and Lisnawaty (2016) explain the same statement that health insurance has a significant influence for everyone to consume healthcare utilization, because it can cover the difficulty of healthcare expenditure

The statement is supported by results of correlation analytics of health insurance toward healthcare utilization in Kendalkerep Primary Healthcare. It is known that there is significant correlation between health insurance toward utilizing Kendalkerep Primary Healthcare with correlation direction positive and correlation strength fair, which means the higher the health insurance ownership so the healthcare utilization will increase and vice versa. The results are line with a study from Djunawan (2019) which explains poor people who get health insurance subsidy have a tendency to use government health services more than people with private or factory health insurance. The results also explain health insurance subsidy can increase healthcare utilization 2–3 times.

Correlation of Access to Healthcare of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Access to healthcare is an enabling factor that can influence individual or family to use health services. Access to

primary healthcare is important, although the government has already given health insurance for everyone (Fatimah and Indrawati, 2019). It is because transportation expense can become a consideration to use health services. Difficulty of access to health services influences individual decision to use health services (Irawan and Ainy, 2018). The near health services location with shelter makes it easier for everyone to utilize healthcare, rather than a long distance that will cost more expense for transportation (Marnah, Husaini and Ilmi, 2016).

The statement is supported by results of correlation analytics of healthcare access toward utilization of healthcare facility in Kendalkerep Primary Healthcare. It is known that there is significant correlation between access of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlation direction positive and correlation strength fair, which means the easier access so the health utilization will increase and vice versa. The results are related with Purbantari dkk., (2019) which explains there is a significant correlation toward healthcare utilization in Janti Primary Healthcare with correlational direction positive and correlational strength low. This study explains that dominant respondents use private transportation, because they should be waiting their sick family during healthcare services.

Correlation of Perception of Illness of PKH Participants in Thematic Village toward Utilizing Kendalkerep Primary Healthcare

Healthcare utilization can be known from need. Need is a direct factor that can influence everyone to use health services. Need is divided into two: perceived need in the form of feeling needs and evaluated need in the form of need from clinical test (Başar, Öztürk and Cakmak, 2018). Basically need detects not only when people start getting sick, but when the body

is healthy there is a need of healthcare utilization for prevent disease (Alhamda, 2014).

The emergence of need for everyone is resulted by perception of being healthy or illness. Perception is a cognitive process experienced by everyone to understand the information. Everyone has a difference perception, because there is a difference when receiving and understanding the information (Mujiati and Yuniar, 2016). If people's perception in the face of illness conditions is false, so healthcare utilization become low, but positive perception of illness impacts to increasing the healthcare utilization. especially in primary healthcare (Irawan and Ainy, 2018).

The statement is supported by results of correlation analytic where it is known that there is a significant correlation between perception of illness of PKH participants in Thematic Village toward utilizing Kendalkerep Primary Healthcare with correlational direction positive and correlational strength fair, which means with a positive perception of illness so the healthcare utilization will increase. The results is related with study from Siyoto (2012) explaining that perception of illness felt by family has a positive impact to healthcare utilization, especially primary healthcare. Kuuire et al. (2015) explain that people with low economic status have a tendency to use health services when getting severe diseases. The statement supports the explanation from Alhamda (2014) that people will need healthcare services when getting severe diseases and they can't do any activities.

Healthcare Utilization Variable Most Correlated toward Utilizing Kendalkerep Primary Healthcare

Exp(β) aimed to interpretation the results so they are easier to understand. Exp(β) is used to find out healthcare utilization variables most correlated with healthcare utilization. Exp(β) is just done for X variable most correlated with Y variable in which health insurance is

23,261 and access is 18,112. Meaning of the results is the higher the health insurance ownership so the healthcare utilization will be increase 23 times and the easier access can increase healthcare utilization 18 times. The results relate to study from Djunawan (2019) showing that health insurance can increase the healthcare utilization from 2 until 3 times. Purbantari dkk.'s (2019) study shows that there is positive correlation between access toward healthcare utilization in Janti Primary Healthcare by tuberculosis sufferers and, based on statistics test, show that easier access can increase healthcare utilization 3 times more than harder access.

CONCLUSION

PKH participants in Thematic Village are already utilizing Kendalkerep Primary Healthcare as main reference during the last six months. Based on statistics test, there are five healthcare variables having a significant correlation toward utilizing Kendalkerep Primary Healthcare. Predisposing factors include education ($\beta = 1.689$) and employment status ($\beta = 1.466$); enabling factors include health insurance ($\beta = 3.045$) access to healthcare ($\beta = 2.819$) and need as perception of illness ($\beta = 2.767$) having a significant correlation toward Kendalkerep Primary Healthcare. Based on Nagelkerke determination the coefficient of health insurance and access is a dominant factor which affects the utilization of Kendalkerep Primary Healthcare of 46% with correlational direction positive and correlational direction fair.

And important thing for utilizing health insurance to access Kendalkerep Primary Healthcare is increased socialization to the community especially those who are in the work area Kendalkerep Primary Healthcare, such as PKH participants in Kampong Lampion Wangi, Kampung Warna Warni Jodipan, and Kampung Tridi. It is because higher of

public health need, but most of the community have difficulty using health insurance so that impacts community action for utilizing healthcare services.

Future study can enlarge the population, adding total sample, and use a qualitative approach with in-depth interview about healthcare utilization. It can also add the healthcare utilization variable which has not been discussed in this study.

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THE DEPRESSIVE AND ANXIETY SYMPTOMS AND PSYCHOLOGICAL DISTRESS AMONG INDONESIAN ADULTS DURING COVID-19 PANDEMIC

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ABSTRACT

Introduction: COVID-19 outbreak has caused changes around the world with many policies made to stop the spread of this virus since it started in 2019. Indonesia with the overall highest positive cases in South-East Asia has been challenged with prolonged restriction policy issued from early 2020 until now due to continuous increase of cases. This study aims to know the mental health of Indonesia citizens during early quarantine before it changed into restriction. **Method:** Indonesian version DASS-21 questionnaire was used in this cross-sectional study to assess Indonesian adults aged > 25 years old using an online platform from 22nd April, 2020 to 28th May, 2020, then analyzed using T-test and one-way ANOVA. **Result:** All participants have no depression and stress symptoms that meet the threshold for probable depression according to the DASS-21 instrument. On the other hand, 26.3% participants showed anxiety symptom with severity classified into mild (16.0%), moderate (8.9%), and severe (0.4%). **Conclusion:** This study also found relationship of depression, anxiety, and stress characteristic with gender, age marital status, and income in adults during pandemic. Where in this study shows male, younger age, unmarried status, and lower income people have higher scale of depression, anxiety, and stress characteristic. This finding may help Indonesia's government and citizens to assess the restriction to mental health of Indonesian adults for further effective policy implementation.

Keywords: Mental health, Indonesian adults, Depression Anxiety Stress Scale 21 (DASS-21), COVID-19 Pandemic

INTRODUCTION

COVID-19 was first found in Wuhan City, Hubei Province of China on 31st December, 2019 where a few clusters of pneumonia cases were reported. On 30th January, 2020, the WHO emergency committee reached consensus on the COVID-19 outbreak as a public health emergency of international concern (PHEIC) (Lai et al., 2020). Transmission of COVID-19 by droplet is supported by many scientists because of lack of evidence for airborne transmission and high infectivity with incubation period up to two weeks (Wu, Chen and Chan, 2020). As of 15th January, 2021, Indonesia has a total of 882,418 positive cases of COVID-19 with 25,484 deaths (COVID-19, 2020). The first

Indonesia COVID-19 confirmed case happened on 2nd March, 2020 and followed with a rapid increase, especially in Java province. In early March, physical distancing was promoted to reduce transmission of COVID-19. The governor of Jakarta declared a state of emergency and regulated large scale social restriction from 31st March, 2020 until early June, which closed most businesses and suspension of large gatherings (World Health Organization Indonesia, 2020).

The restriction policy made by the government certainly altered the usual activities of the public, thus the COVID-19 pandemic as a public health emergency not only affected health and safety but also wellbeing, which included feeling of insecurity, confusion, emotional isolation,

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and stigmatization (Pfefferbaum and North, 2020). People that might be vulnerable to psychological problems due to the pandemic are children, adolescents, elderly, jobless or homeless, suspected/ diagnosed patients with COVID-19, health workers, and those with pre-existing mental conditions (Das, 2020). Stressors might happen previously, during, or even after quarantine/ restriction. During quarantine, stress might be caused by duration, fear of infection, inadequate supplies, and lack of information. After quarantine stressor might also happen due to finance and stigmatization (Brooks et al., 2020).

The World Health Organization and World Health Assembly saw the importance of mental health, thus, in 2013, they adopted a Comprehensive Mental Health Action Plan. (World Health Organisation, 2017). Depression, anxiety, and stress often affect population worldwide, especially in such sudden events like a pandemic which cause a heavy burden to society. Depression is defined as a disorder characterized by melancholic feeling of unhappiness, grief, sadness, and despair. Anxiety is a disorder characterized by feelings of anxiety, fear, apprehension of danger, and often accompanied with physical symptoms of restlessness, tension, tachycardia, or dyspnea. Stress is characterized by significant dissociative states seen after overwhelming trauma (American Psychiatric Association, 2013). The World Health Organization saw the importance of a planned response to mental health disorder associated with disability, premature mortality, and which may impact their families, community, or society (World Health Organisation, 2017).

Previous epidemic/ endemic has been associated with 30% increase of suicide because of economic issues in 2003 and stigmatization to health workers or infected patients in 2014 and 2018 (Torales et al., 2020). The strategy to prevent the same thing happening is by improving the monitoring or reporting rates of mental health problems and finding out the causes

of those problem for a long-term strategy (Holmes et al., 2020). Lack of knowledge about COVID-19 prevention in Indonesia population also proves the urgency to understand the long-term effect of the COVID-19 pandemic, including mental health (Adella Halim et al., 2020; Pfefferbaum and North, 2020).

Similar studies have been done before; however, in Indonesia study that measures the score of depression, anxiety, and stress symptoms specifically for adults during the COVID-19 pandemic is not much done in the early period of the pandemic in Indonesia. Thus, this study is necessary to monitor and increase reported depression, anxiety, and stress cases of Indonesian general population during the COVID-19 pandemic. The aim of this study is to assess or measure the depression, anxiety, and associated psychological distress of Indonesian people during the COVID 19 pandemic and associated demographic factors. The demographic factors being studied in our study are: gender, age, marital status, education level, work from home, income changes and range during pandemic.

METHODS

Sample and Procedure

This cross-sectional study was done in Indonesia from 22nd April, 2020 to 28th May, 2020 using an online platform. The data were advertised by using e-posters that were shared to various social media and links of e-form attached to it. This study also has ethical approval with number 141/K-LKJ/ETIK/IV/2020 obtained from Pelita Harapan University, Indonesia ethics board.

The criteria for this study are adult people aged more than 25 years old and who agreed to join this study by signing e-informed consent. The authors set starting age from 26 until 65 based on the World Health Organization definition of adults above 19 years old and below 65 years old. In addition, as the population target is Indonesian, authors followed the statistical

trend of undergraduate study completion at age 23-25 years old in Indonesia, thus age was categorized above 25 years old to reduce the bias of having students. Data with adults working as health workers or studying as medical students are also excluded to avoid bias results..

Participants were given questionnaire online with a few sections, starting with explanation of purpose, informed consent, participant identity, demographic data, and DASS-21 questionnaire. During the informed consent and identity section, participants who are not eligible were directly directed to submit section and not required to continue with the study. All participants' demographic data regarding their gender, age, marital status, education level, ability to work from home during the pandemic, income changes during the pandemic, and income range normally before the pandemic were also included in this study. A total of 269 data was collected after inclusion and exclusion criteria processing was done

Income changes during the pandemic are categorized into: same, decrease, no steady income, and no income at all. Decrease option meant for the full-time workers still tied with a contract and getting paid less because of the pandemic. No steady income is similar to freelancers where before and during the pandemic they have no full-time job. The income range of participants is divided into: above Rp10.000.000 (690USD), Rp5.000.000-Rp10.000.000 (345-690USD), below Rp5.000.000 (345USD), and no income. This range is based on the minimum wage in the capital city as around Rp4.500.000 (310USD).

Instruments

Depression Anxiety Stress Scale 21 (DASS-21) Questionnaires were used to quantitatively measure and distinguish the three axes of emotional syndrome including depression, anxiety, and stress. Depression scales measure hopelessness, low self-esteem, and low positive affection. Anxiety

scales evaluate autonomic arousal and situational anxiety. Stress scales measure tension, negative affection, and agitation.(González-Rivera, Pagán-Torres and Pérez-Torres, 2020)

The Indonesia version of DASS-21 Questionnaire validation given to college students by Kinanthi has Cronbach's alpha 0.912 overall with reliability per dimension 0.853, 0.777, and 0.905, respectively, to depression, anxiety, and stress symptoms. The results are classified into five, which are normal, mild, moderate, severe, and extremely severe. Depression category scores are: 0 – 4 for normal, 5 – 6 for mild, 7 – 10 for moderate, 11 – 13 for severe, and 14 above for extremely severe. Anxiety category score: 0 – 3 for normal, 4 – 5 for mild, 6 – 7 for moderate, 8 – 9 for severe, and 10 above for extremely severe. Stress category score: 0 – 7 for normal, 8 – 9 for mild, 10 – 12 for moderate, 13 – 16 for severe, and 17 above for extremely severe. (Kinanthi et al., 2020)

Statistical analysis

Collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. First data were categorized into some categories that had been set before, then the data were cleaned from exclusion criteria. Then descriptive analysis was done to know the demographic of data including sex, age, marital status, education level, work from home, and income.

The DASS-21 variables were presented with mean and standard deviation of scale from each domain depression, anxiety, and scale. In addition, domains having abnormal result were further classified into class of severity of respective psychological symptoms. The classification result was then presented in percentage.

Analysis result mean of DASS-21 was then carried out by using T-test and one-way ANOVA to each variable. Demographic data including gender, age, marital status, education level, ability to work from home during the pandemic,

income changes, and income range were each analysed with respect to domain scale mean of depression, anxiety, and stress from DASS-21. Each domain was then presented independently with each variable categories and the association result.

RESULTS

Result of DASS – 21

The Indonesia version of DASS-21 questionnaire shows 100% respondents do

not have any symptoms of depression and stress. The mean of depression is 3.03 ± 1.278 , while the mean of stress is 4.67 ± 1.840 for Indonesia's adult population. The mean for overall anxiety is 6.22 ± 2.294 which score indicated moderate sign of anxiety. Respondents in this study also have various anxiety severity categories where 74.7% show normal results, 16.0% show mild symptoms, 8.9% show moderate symptoms, and 0.4% show severe symptoms.

Table 1. DASS – 21 result in Indonesia population (N= 269)

DASS-21	Overall Mean	SD	Categories	N	Percentage (%)
Depression	3.03	1.278	Normal	269	100
Anxiety	6.22	2.294	Normal	201	74.7
			Mild	43	16.0
			Moderate	24	8.9
			Severe	1	0.4
Stress	4.67	1.840	Normal	269	100

Description of the sample

A total of 269 Indonesian adult population aged between 26-65 years old was collected with a mean age of 38.12 ± 10 . Participants were also classified with latest education, marital status, workplace during pandemic, income range, and the income changes during pandemic. The majority of the participants are male (58.4%), aged 26-35 years old (49.1%), married (56.9%), and bachelors (50.6%).

In general, male and female distribution does not differ too much with percentage 58.4% male and 41.6% female. Age is classified into four categories, which are 49.1% aged 25-35, 22.3% aged 36-45, 31.9% aged 46-55, and 6.7% aged 56-65. This classification is based on WHO range for adult age in addition to data of normal graduated age in Indonesia. Marital status in this study is classified into 38.3% unmarried, 56.9% married, and 4.8% divorced.

The education level of subjects is classified into six categories including elementary, junior high school, high school, diploma, bachelor, and master degree. The participants' last education in this study is categorized into 0.7% elementary level, 1.9% junior high school level, 24.5% high school level, 12.6% diploma level, 50.6% bachelor level, and 9.7% master degree level.

This study also includes the work change of respondents during the COVID-19 pandemic, which is important because of socioeconomic factors that may influence the occurrence of depression, anxiety, or stress. Most respondents are able to work from home (39.8%); however, this number does not greatly differ from respondents that are only able to work partially at home (36.4%). Most respondents also have decreased income due to COVID-19 (39.0%) and range of income less than Rp5.000.000 (33.8%).

Table 2. Demographic distribution of participants

Variable	Distribution	Frequency	Percentage (%)
Gender	Male	157	58.4
	Female	112	41.6
Age	26-35	132	49.1
	36-45	60	22.3
	46-55	59	31.9
	56-65	18	6.7
Marital status	Unmarried	103	38.3
	Married	153	56.9
	divorced	13	4.8
Education	Elementary	2	0.7
	Junior high school	5	1.9
	High school	66	24.5
	Diploma	34	12.6
	Bachelor	136	50.6
	Master	26	9.7
Work from home	Yes	107	39.8
	Partially	98	36.4
	No	34	12.6
	Unemployed	30	11.2
Income changes during pandemic	Same	94	35.0
	Decrease	105	39.0
	No steady income	29	10.8
	No income at all	41	15.2
Income range	> Rp10.000.000	82	30.5
	Rp5.000.000-Rp 0.000.000	57	21.2
	< Rp5.000.000	91	33.8
	No income	39	14.5

The majority population in Indonesia have different abilities to work from home in accordance to their respective job and law of restriction which allows essential sectors to keep going, while the rest must be stopped. Thus, this study categorized work from home into able, partially, unable, and unemployed where the distribution ranged 39.8% able to work from home, 36.4% partially work from home, 12.6% unable to work from home, and 11.2% unemployed during the COVID-19 pandemic.

The income change during the pandemic is an important variable as psychological effect is mostly contributed from financial problems; thus, this study especially asked the question regarding this issue. This study found that 35.0% of

participants have the same income before and during pandemic, 39.0% of participants' income reduced during the pandemic, 10.8 participants have no steady income, and 15.2% have no income at all during the pandemic.

This study also categorized the income range into more than 10 million rupiah, 5 to 10 million rupiah, less than 5 million rupiah, and no income at all. These categories are based on the minimum wage based on government issues in Jakarta as the capital city of Indonesia which is 5 million rupiah each month; this reference is taken as this study centered in Java as most highly populated region in Indonesia. The participants' income ranges with 30.5% earn more than 10 million rupiah each month, 21.2% earn 5 to 10 million rupiah

each month, 33.8% earn less than 5 million rupiah each month, and 14.5% earn no income at all.

Analysis of the variable and DASS – 21

Analysis results of the depression domain all showed normal value within every variable. However, males have higher results (mean:3.24±1.375) compared to females (mean:2.73±1.065) with p-value 0.003, thus there is a significant difference between depression value in each gender. Between the age group, age 26-35 indicates the highest result in the depression domain (mean:3.30±1.348) and p-value of 0.010. From marital status, depression results were found highest in unmarried adults (mean:3.35±1.419) with p-value 0.001. For

the education level, results were found highest in high school graduated adults (mean:3.33±1.439) with p-value 0.231.

The analysis of DASS 21 depression found highest in respondents that were unable to work from home (mean:3.47±1.522) compared to people that were able or partially to work from home in addition to unemployed with p-value 0.121. Depressive symptoms were found most elevated in adults who have no steady income in this pandemic (mean:3.21±1.424) compared to other options of income changes during the pandemic with p-value of 0.760. Respondents with income below Rp5.000.000 showed highest DASS 21-depression result (mean:3.57±1.572) and p-value of 0.000 .

Table 3. Analysis of Variables DASS-21 for Depression

Variable	Distribution	Depression		
		μ	SD	P
Gender	Male	3.24	1.375	0.003
	Female	2.73	1.065	
Age	26-35	3.30	1.348	0.010
	36-45	2.76	1.233	
	46-55	2.82	1.151	
	56-65	2.71	0.985	
Marital status	Unmarried	3.35	1.419	0.001
	Married	2.88	1.172	
	divorced	2.31	0.480	
Education	Elementary	2.00	0.000	0.231
	Junior HS	3.20	1.095	
	High school	3.33	1.439	
	Diploma	2.88	1.094	
	Bachelor	2.98	1.291	
	Master	2.77	0.951	
Work from home	Yes	2.87	1.229	0.121
	Partially	3.06	1.200	
	No	3.47	1.522	
	Unemployed	3.00	1.339	
Income changes during pandemic	Same	2.97	1.150	0.760
	Decrease	3.08	1.313	
	Not steady	3.21	1.424	
	None at all	2.93	1.385	
Income range (million rupiah)	>10	2.59	0.929	0.000
	5 - 10	3.00	0.982	
	<5	3.57	1.572	
	No income	2.74	1.093	

Analysis of results of anxiety domain in males have higher results (mean:6.67±2.513) compared to females (mean:5.59±1.773) with p-value 0.000, which means there is a significant difference between DASS 21-anxiety value score in each gender. Between the age group, age 26-35 showed the highest anxiety result (mean:6.74±2.417) and p-value of 0.003. From marital status, anxiety result was found highest in unmarried adults (mean:6.93±2.410) with p-value 0.000. From education level, the highest anxiety result was found in junior high school graduated adults (mean:7.40±2.608) with p-

value 0.166.

The analysis of DASS 21-anxiety showed the highest result in adults that were unable to work from home (mean:6.68±2.306) compared to people that were able or partially to work from home or unemployed with p-value 0.168. The result of anxiety was found highest in adults who have no steady income in this pandemic (mean:6.97±1.424) compared to other options of income changes during the pandemic with p-value of 0.313. Adults with income <Rp5.000.000 show highest DASS 21-anxiety result (mean:7.18±2.747) and p-value of 0.000.

Table 4. Analysis of Variables DASS-21 for Anxiety

Variable	Distribution	Anxiety		
		μ	SD	P
Gender	Male	6.67	2.513	0.000
	Female	5.59	1.773	
Age	26-35	6.74	2.417	0.003
	36-45	5.83	2.079	
	46-55	5.77	2.044	
	56-65	5.29	1.929	
Marital status	Unmarried	6.93	2.410	0.000
	Married	5.80	2.150	
	divorced	5.54	1.561	
Education	Elementary	4.00	0.000	0.166
	Junior HS	7.40	2.608	
	High school	6.64	2.298	
	Diploma	6.18	2.110	
	Bachelor	6.15	2.365	
	Master	5.54	1.964	
Work from home	Yes	5.86	2.329	0.168
	Partially	6.46	2.235	
	No	6.68	2.306	
	Unemployed	6.20	2.265	
Income changes during pandemic	Same	6.06	1.150	0.313
	Decrease	6.16	1.313	
	Not steady	6.97	1.424	
	None at all	6.20	1.385	
Income range (million rupiah)	>10	5.35	1.666	0.000
	5 - 10	6.11	1.760	
	<5	7.18	2.747	
	No income	5.97	2.206	

Analysis of results of stress showed normal categories in all variables; however, quantitatively it showed some difference within variables. Males have higher results of DASS 21-stress (mean:4.96±2.011) compared to females (mean:4.28±1.490) with p-value 0.001. Between the age group, age 26-35 showed the highest stress result (mean:5.11±2.051) and p-value of 0.002. From marital status, stress result was found highest in unmarried adults (mean:5.18±2.051) with p-value 0.000. From the education level, the highest stress result was found in high school graduated adults (mean:4.95±1.827) with p-value

0.453 but statistically not significant.

Adults that were unable to work from home showed the highest DASS 21-stress results (mean:4.97±1.915) compared to people that were able or partially to work from home or unemployed with p-value 0.459. The result of stress was also found highest in adults that have no steady income in this pandemic (mean:5.03±2.009) compared to other options of income changes during the pandemic with p-value of 0.679. Adults with income <Rp5.000.000 show highest DASS 21-stress result (mean:5.27±2.206) and p-value of 0.000.

Table 4. Analysis of Variables DASS-21 for Stress

Variable	Distribution	Stress		
		μ	SD	P
Gender	Male	4.96	2.011	0.001
	Female	4.28	1.490	
Age	26-35	5.11	2.051	0.002
	36-45	4.22	1.511	
	46-55	4.42	1.535	
	56-65	3.94	1.391	
Marital status	Unmarried	5.18	2.052	0.000
	Married	4.43	1.657	
	divorced	3.46	0.660	
Education	Elementary	3.00	0.000	0.453
	Junior HS	5.40	2.302	
	High school	4.95	1.827	
	Diploma	4.68	1.590	
	Bachelor	4.57	1.876	
	Master	4.46	1.944	
Work from home	Yes	4.47	1.920	0.459
	Partially	4.79	1.818	
	No	4.97	1.915	
	Unemployed	4.70	1.512	
Income changes during pandemic	Same	4.55	1.597	0.679
	Decrease	4.69	1.963	
	Not steady	5.03	2.009	
	None at all	4.66	1.944	
Income range (million rupiah)	>10	4.00	1.457	0.000
	5 - 10	4.84	1.521	
	<5	5.27	2.206	
	No income	4.44	1.569	

DISCUSSION

This is among the earliest studies which evaluate depressive and anxiety symptoms and psychological distress, specifically for adults during the end phase of COVID-19 large scale social restriction in Indonesia. This means we can know the characteristics of Indonesian adults near the end of restriction after one month. The data are obtained mostly from Java citizens where most COVID-19 positive cases are found; it can represent the overall Indonesia population characteristics during the pandemic.

The result showed that all Indonesia's population that participated in this study have a normal score of depression and stress; however, about 26.3% showed anxiety symptoms. This finding differs from study by Argo, Kurniawan et al., (2021) which found depression in Indonesia adults during COVID-19. The participants in this study might not have any depression or stress symptoms because data that we collected happened during almost the end of large scale restriction. During the government restriction, most economic stores were closed and coincidentally fell on Eid Mubarak holiday, so most population had already returned to their hometown early and spent the restriction with their family. Regular contact with loved ones is suggested by the WHO to cope with the pandemic healthily, thus staying with family gives a positive impact for mental health and might be the reason of low score for both depression and stress symptoms in this study. In addition, as study was done during the early period of COVID-19 in Indonesia, it is possible that people had not yet been impacted greatly to cause depression or stress (World Health Organization, 2020).

The positive finding of anxiety symptoms is in line with Jungmann and Witthöft (202) and Xiong et al. (2020). Jungmann and Witthöft (2020) explain anxiety can be caused by cyberchondria about pandemic information and adaptive

emotion regulation of the general population regarding the plausibility of getting disease serves as risk factor of anxiety. Although this study did not measure the communication and social aspect of participants, as this study was taken at the early period of COVID-19 in Indonesia, it is reported that the news and knowledge regarding it is still limited. Study by Anindyajati and Ahmad (2020) explain that inaccessible information, lack of social connection, unsupportive environment, and lack of surveillance can likely contribute as anxiety trigger (Ahmad and Murad, 2020; Anindyajati et al., 2021).

Previous study by Argo et al., Mazza et al. and Verma and Mishra shows different results regarding gender wherein, females tend to have higher risk of depression, anxiety, and stress (Argo et al., 2021; Mazza et al., 2020; Verma and Mishra, 2020). In this study, however, we found that males have higher risk of getting depression, anxiety, and stress. This might be explained by males have higher risk of getting psychological issues as they have responsibility as head of family. In Indonesia, the majority of families only have one income source from the male, as females mostly choose to become a housewife. This statement coincides with data by AIPEG and Monash University which presented Indonesia's women labor participation as relatively low compared to men with a ratio of 2:3 (AIPEG and Monash University, 2017).

The result also showed that the population aged 26-35 and unmarried have a higher score value of depression, anxiety, and stress. Study by Serafini et al. (2020) also shows younger ages have a higher tendency of getting depressed, anxious, and stressed, although we found differences in the study population starting at 18 years old. Our study also coincides with study by Argo et al. (2021) which found that adult population in Indonesia is 4.6 times likely to have psychological symptoms like depression, anxiety, and stress compared to adolescents. This can be explained by

Indonesia's prevalence of active worker population within age 26 to 35. In addition, this starting age is mostly fresh graduates, which might cause sudden changes of the pandemic situation to impact their life to start their profession. Emerging adulthood or younger adults might have higher tendency with psychological issues because it is a transitional age from young adulthood to middle adulthood where many changes should be happening in their life, for example, starting a career, marriage, family, and many others (Wood et al., 2018).

Adults with income below Rp5.000.000 also had a higher score of depression, anxiety, and stress. This result is also similar to Serafini et al.'s (2020) previous study which shows correlation of less income with depression, anxiety, and stress as economic issues are a big contributor to psychological problems. We also found the group who have no income scored better anxiety symptoms than adults who have income below Rp5.000.000. It is possible that the group which has no income in our studies are those who are dependent on another person or family member for their living and personally have less concern about financial issues, at least for the relatively short-term social restriction. This study is also in line with findings by Ettman et al. (2020) which explained people who used to have income but less have greater risk of having depression as they are more stressor exposure with many political and economic changes happening while being unprepared for the COVID-19 pandemic.

This study shows no significant relationship between education level and DASS-21 score. This result is similar to the Verma and Mishra (2020) study that shows no relationship between education level and symptoms of depression, anxiety, and stress. For this study, that all three scores show no significant difference might be explained because the information about COVID-19 has been disseminated among the population regardless the education group. To our knowledge, the government has

been using several media platforms for this purpose, including social media. This in line with the fact of high smartphone penetration in Indonesia (Marius and Pinontoan, 2014).

This study failed to show the relationship between work from home and DASS-21 score. This finding is different compared to study by Maaza et al. (2020), where having to go out to work has significant differences with symptoms of depression, anxiety, and stress. Although no relationship was found, this study showed slightly higher scores for people that were unable to work from home. This is possible because their safety is at risk when they have to go work outside where there is a possibility of meeting others who might be a carrier of the virus (Li et al., 2020).

There is also no significant difference for income change and DASS 21 score. This result cannot be compared with other studies because there was no study found categorizing the changes of income during the pandemic. In this study, adults that have no steady income show a higher score of DASS-21 which might due to uncertainty in fulfilling daily needs, where they need to survive this pandemic without knowing when it will end. Another study explains unsteady paid workers have higher concern due to inability to plan the future where they have to worry about payday and bill payment due date (Gross, Musgrave and Janciute, 2018).

The limitation of this study is because it uses an online platform; this means we cannot reach remote populations that have no access to the internet. Further study to improve this finding needs to be done by increasing the number of participants, more controlled distribution, and follow-up following certain events. In addition, participants' history of depressive, anxiety symptoms and psychological distress also need to be taken into account. Further studies are also warranted to elaborate factors contributing to higher depression, anxiety, and stress level among

the groups with less income, unmarried, and younger adult.

CONCLUSION

In conclusion, that Indonesia's adult population has no depression and stress might be related to the fact the restriction fell near the holiday period from April to May. In addition, the score is relatively normal because adults mostly spend their holiday with family and do activity together. However, 26.3% showed symptoms of mild, moderate, and severe anxiety due to facing a disease that is easily transmitted and has no vaccine yet. This study also found there is a relationship between gender, age, marital status, and income range with depression, anxiety, and stress characteristic in adults during pandemic. Adult depressive, anxiety symptoms and psychological distress are mostly affected by the economic level, thus the government played a crucial role in this challenging pandemic that not only faced health issues but also economic issues that might correlate with one another.

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AN OVERVIEW OF PSYCHOLOGICAL PERCEPTION, PSYCHOLOGICAL DISTRESS, AND COPING STRATEGY OF YPPM AL-MUTTAQIEN TEACHERS IN BALIKPAPAN AGAINST COVID-19 PANDEMIC

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ABSTRACT

Introduction: The change of education system during COVID-19 pandemic was a big challenge for teachers. These changes can lead to exhaustion for teachers, as happened to some elementary school teachers in Banten. A long period of exhaustion can develop into psychological distress such as anxiety, stress, and depression. This psychological distress can be controlled by implementing appropriate coping strategies for each individual. This study aims to describe the psychological perceptions, psychological distress, and coping strategies of teachers of YPPM Al-Muttaqien Balikpapan city in the midst of COVID-19 pandemic. **Method:** This research used quantitative descriptive method with cross sectional design. The research subjects were 17 respondents who were determined using the total sampling method. The variables of the study included individual characteristics, psychological perceptions, psychological distress, and coping strategies variable. The data analysis technique was performed using univariate analysis. **Result:** showed that there were 15 respondents who felt anxious about the COVID-19 pandemic. From 15 respondents, 3 people experienced moderate anxiety, 1 experienced moderate stress, and 2 experienced mild depression. Of the 2 respondents who admitted that they were not worried about the COVID-19 pandemic, 1 of them experienced mild depression. As many as 58.8% of respondents tended to use the EFC (Emotion Focused Coping) coping strategy and 41.2% used the PFC (Problem Focused Coping) coping strategy. **Conclusion:** The sub-coping most frequently used by respondents is playful problem solving and accepting responsibility.

Keywords: Teacher, Psychological Distress, Coping Strategy, COVID-19

INTRODUCTION

At the end of 2019, a new type of coronavirus was discovered and first identified in Wuhan, China. The first transmission of COVID-19 is presumed to have derived from animal to human that occurred at an illegal wild animal trafficking market in Wuhan. Zhu et al. (2020) of Wuhan Institute for Virology released a journal showing that the new coronavirus genetic structure is 96% identical to the coronavirus found in bats.

According to the WHO (2020), the new type of coronavirus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, or breathe. These particles range from

larger respiratory droplets to smaller aerosols. The transmission can also occur when a person touches the surface of an object that contained COVID-19 then touches the eye, nose, and mouth. The most common symptoms of COVID-19 are fever, cough, sore throat, and difficulty breathing or shortness of breath. Those symptoms are very common in other diseases so it becomes difficult to identify the cases caused by COVID-19. According to the WHO, symptoms tend to appear between five and six days after infection.

Since the beginning of 2020, according to the WHO (2020) timeline, COVID-19 has infected almost all countries in the world. Therefore, the World Health Organization declared that COVID-19 is a

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pandemic disease in March 2020. Based on data from COVID-19 Task Force, the confirmed cases of COVID-19 are continuing to increase. Reported from the first case in February until October 2020, the worldwide number of confirmed cases of COVID-19 reached 36,933,166 cases came from 216 countries with 1,068, 995 deaths. In Indonesia, the number of COVID-19 cases reached 328,952 cases with 251,481 cured cases and 11,765 deaths. Therefore, the Indonesian Government has confirmed COVID-19 as a national disaster as stated in Presidential Decree number 12 of the year of 2020, and also released the 91 days COVID-19 disaster emergency status starting from February 29th to May 29th, 2020.

The COVID-19 outbreak has an impact on every aspect of life, including political, economic, social and cultural, national security system, educational system and also has a big impact on public welfare. In the educational system, in order to break the chain of transmission of COVID-19 in school areas, the Minister of Education and Culture of the Republic of Indonesia released two policies through circular letter number 3 of 2020 and circular letter number 4 of 2020. Both policies regulate the new learning system called study at home policy as known as online learning system. The Ministry of Religious Affairs has also released a policy regarding learning and assessment mechanism of Madrasah in the emergency period of COVID-19 by implementing an online learning system.

According to the report of Regional COVID-19 Task Force in East Kalimantan, up to August 5th 2020, confirmed cases of COVID-19 in East Kalimantan were 1,665 cases with 1,032 cured cases and 42 deaths. Balikpapan city is the largest contributor to COVID-19 cases in East Kalimantan province, with 613 total cases consisting of 364 cured cases and 28 deaths. Therefore, in March 2020, the Department of Education and Culture of Balikpapan city released a

circular letter number 420/1842/SKT/III/2020 to inform the policy regarding the study at home learning system would be extended to an undetermined period of time.

Due to the tremendous infectious ability of COVID-19, the disease has instilled a considerable degree of fear, worry and concern in society and among certain communities in particular, such as elderly, healthcare providers and people with underlying health conditions. In public mental health terms, the main psychological impact to date is elevated rates of stress or anxiety. Levels of loneliness, depression, harmful alcohol and drug use, and self-harm or suicidal behavior are expected to rise. In this crisis situation of lockdown, health and mental health professionals face a big challenge due to very little information regarding the psychological impact and underlying mental health conditions of the general public (Kazmi et al., 2020). Many countries have declared unprecedented lockdowns and emergency. The schools, colleges, universities, pubs markets, malls, shopping complexes, etc., have been re shut down by the governments. It has created an environment of fear, anxiety and stress among the developed and developing societies (Singh, 2020).

The COVID-19 pandemic is also has a major influence on the implementation of teaching and learning activities. There are two impacts that affect the sustainability of educational activities caused by the COVID-19 pandemic, which are short-term impact and the long-term impact (Aji, 2020). Many citizens and rural people have experienced the short-term impact of COVID-19. In Indonesia, there are still many people who are unfamiliar about online learning systems, so that is a big challenge for all students' parents at home to oversee their children while using this new learning system. Besides, the online learning system is presumed to play a part in triggering psychological problems in all

circles at school, including teachers, students, and parents. That phenomenon happened because of the sudden change of the educational system due to the COVID-19 pandemic. Furthermore, the long-term impact of COVID-19 outbreak lies in the aspect of justice and the increase of educational inequality between community groups and regions in Indonesia.

Online learning during the pandemic had never been experienced in the world of education in Indonesia, as well as Balikpapan city in particular. According to exploratory study research in 2020 conducted on several teachers in Banten, online education still does not have a standard system and clear guidelines, thus causing confusion among teachers (Purwanto et al., 2020). Moreover, all teachers experienced the increased spending of internet access quota, and also teachers started to feel exhausted by working from home over a long period of time. Further, there are some difficulties in online education system during the COVID-19 pandemic which are less effective such as tedious study subjects, inequality of digital technology, and the economic status of the student (Nurkolis and Muhdi, 2020).

The challenges and hardships of online education during the pandemic is considered as a big pressure which can lead to exhaustion (Agustin et al., 2020). A long exhaustion can be a stimulus of psychological distress among teachers, which leads to anxiety disorder, stress, and depression. Anxiety is a common reaction that can happen to anyone, particularly someone who is dealing with big pressures and a stressful situation in life. Common anxiety signs and symptoms include feeling of uneasiness and discomfort where a person feels insecure like a danger is getting in the way. Exaggerated anxiety can cause a person to experience psychosomatic symptoms such as feelings of anxiety, tension, fear, sleeping disorder, intelligence disorders, depressed feelings (moody), somatic or physical symptoms in

muscles, sensory system, cardiovascular, respiratory, digestive, urogenital, autonomy, and behavioral symptoms or attitudes (Lumban Gaol, 2016).

Another stimulating factor of anxiety during COVID-19 pandemic is a long period of working at home and social distancing, which causes an exhaustion feeling due to the obstruction of society. Social distancing involves staying away from people to avoid the spreading of the virus. It is a new emerging terminology which means to avoid the crowd. This has forced people to work from home and avoid social gatherings and contacting even their near ones. According to a research by Singh (2020), the prevention program of COVID-19 transmission known as social distancing has a negative impact on people's mental health. Eric Kleinberg, a sociologist from the University of New York, stated that humans are facing a new period of social pain, that is the feeling of suffering due to social distancing which requires people to work and isolate themselves at home (Singh, 2020).

Anxiety that occurs over a long period of time can cause stress feeling, which disturbs daily activities. Stress is a disruption of body and mind caused by the sudden changes in the environment and the pressure in life such as losing a job, suffering an illness, divorce, and so on. Another mental disorder often found in society is depression. Depression is a condition of disruption in human function related to feelings and comorbid symptoms, including sleeping and eating disorder, psychomotor agitation, concentration deficit disorder, fatigue, desperate and helplessness feelings (Lumban Gaol, 2016).

Teachers have a massive role in shaping the character of students in schools. Hamallik (2004) states that the teacher's first role is as an educator, who is in charge of providing services for students in order to achieve the goals of the school. The next teacher's role is as a guide; the teacher

provides guidance for students to be able to understand and direct themselves to adjust themselves not only in the school environment, but also in family circles, and in the community.

Based on the importance of the teacher's role in the learning process at school, the teacher must be able to give a good example for the students. Besides, in the COVID-19 pandemic situation, teachers are certainly experiencing a phase full of pressures, where they are obliged to be able to adapt with sudden changes in the learning system due to the outbreak. If teachers fail to adapt, they are possibly experiencing psychological disorders like anxiety, stress, and depression. These psychological disorders can cause reactions or responses both physically and emotionally such as decreased cognitive function, irritability and impatience, anxiety, feeling hopeless, sad, and depressed, unable to feel positive things, and so on.

The psychological impact that occurs in teachers will affect their performance in carrying out their role as educators. Teachers will tend to get angry very easily because of trivial things and take their anger out on students. If this situation continues, it will definitely have another impact on students' mental health. These statements are in line with a study conducted by Yoon (2002) of teachers in America which indicates a significant correlation between teachers who experience stress with a negative relationship between teacher and students. Hence, psychological issues in teachers become an urgent problem that needs to be followed up before it inflicts another problem.

According to the transactional model of stress theory, when a situation provides stressful stimuli, the individual will carry out an appraisal process and then carry out a coping process. Coping is a process when a person tries to adjust the differences between demands and resources which are assessed in a stressful event or situation (Hawari, 2001).

Coping strategies arise when there is physical and emotional tension that causes discomfort, those feelings then motivate the individual to make efforts to reduce the feelings that disturb them. Thus, the psychological distress that occurs among teacher can be controlled if the teacher implements appropriate and effective coping for each individual.

During the COVID-19 outbreak, experts and government focused more on the COVID-19 prevention and control program and also overcoming economic problems. Meanwhile, other impacts caused by the COVID-19 pandemic, such as psychological impacts, especially in the education field, are still slightly neglected. Currently, the literature that has been published mainly discusses about psychological conditions in students, so it is also necessary to conduct research to find out the psychological condition of teachers in the midst of the COVID-19 pandemic.

METHODS

This research used quantitative research with a descriptive approach. The study population was all teachers at YPPM Al-Muttaqien Balikpapan. The research sample was determined using total sampling method with inclusion criterion of teachers experiencing online learning program in the midst of the COVID-19 outbreak. The total of samples was 17 people consisting of teachers at Roudhatul Athfal (RA) and Madrasah Ibtidaiyyah (MI) YPPM Al-Muttaqien Balikpapan. The variables in this study include respondent characteristics, psychological perceptions, and psychological distress consisting of levels of anxiety, stress, and depression, as well as variables of coping strategies.

Data were obtained from several questionnaires, including questionnaires for respondent characteristics, psychological perceptions questionnaires, Depression, Anxiety, and Stress Scale (DASS)

questionnaires to measure levels of anxiety, stress, and depression as well as to describe the manifestations of psychological distress. In addition, there was also Ways of Coping (WoC) questionnaire to find out the descriptions of the usage of coping and sub-coping strategies that are most often used by respondents in overcoming or controlling psychological distress while teaching in the midst of the COVID-19 pandemic.

The data analysis technique was computerized by using univariate analysis, also known as objective descriptive analysis which aims to describe the condition of the phenomenon that occurs. Descriptive analysis was selected as a data analysis technique in this study by considering the large population numbers, where the population in this study is relatively small and the whole population is a research sample. so it does not require probability to describe the variables studied. Then all the research data obtained were processed quantitatively to report the results in the form of frequency distribution, proportion (%), narrative, tables, graphs, diagrams, and pictures of each variable of the study.

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RESULTS

An Overview of Al-Muttaqien Modern Islamic Boarding School Foundation Balikpapan

Al-Muttaqien Modern Islamic Boarding School Foundation is a boarding school that was established in 1985 and has formal and non-formal education programs under the Ministry of Religious Affairs Republic of Indonesia. Al-Muttaqien Islamic Boarding School Foundation has three levels of education: Roudhatul Athfal (RA) equivalent to kindergarten, Madrasah Ibtida'iyah (MI) equivalent to elementary school, and Madrasah Tsanawiyah (MTs) equivalent to junior high school. MTs students are required to stay in dormitory

during school but allowed to return home in certain conditions, especially during long holidays. Whereas RA and MI education levels are the same as schools in general, there are only a few additional religious subjects so that the duration of study is longer than general school, but it is still adjusted to the class level of the students.

During the COVID-19 pandemic, MTs students continue to carry out face-to-face learning activities in the dormitory or school area while still undergoing COVID-19 prevention health protocol procedures and limiting activities in and out of the cottage area. Meanwhile, since March 2020, the RA and MI levels must carry out online learning activities.

Characteristics of Respondents

Table 1. Characteristics of Respondents

No.	Characteristics of Respondent	Total	%
1.	Male	3	17.6
	Female	14	82.4
		17	100
2.	Young adult	9	52.9
	Middle adult	8	47.1
	Late adult	-	-
		17	100
3.	Single	6	35.3
	Married	11	64.7
	Widow/Widower	-	-
		17	100
4.	Headmaster	2	11.9
	Teachers	13	76.5
	Administrative staff	1	5.8
	Other :	1	5.8
		17	100
5.	<5 years	8	47.1
	5-10 years	4	23.5
	>10 years	5	29.4
		17	100
6.	<2.981.378,72	16	94.1
	>2.981.378,72	1	5.9
		17	100

Based on Table 1, it can be seen that most were female, as many as 14 people (82.4%) and the remaining three were male (17.6%). The age distribution of respondents was dominated by young adults (18-30 years) as many as nine people (52.9%) and the remaining eight people were middle adults (47.1%). The distribution of marital status was 64.7% married and 35.3% single. Respondent occupations consist of two school principals, from RA and MI levels, 13 teachers, one administrative staff, and one other position that had role as administrative staff, also serves as teacher and school operator. The distribution of respondents period of employment showed that eight people (47,1%) worked for <5 years, five people (29.4%) worked for > 10 years and as many as four people (23.5%) worked for 6-10 years. Furthermore, 16 respondents (94.1%) had an income below the minimum wage of Balikpapan city and only one respondent (5.9%) had an income above the minimum wage.

Psychological Perceptions, Psychological Distress, and Coping Strategies Overview

There were 15 out of 17 respondents (88%) admitted to feel anxious about the COVID-19 pandemic, while two other respondents (12%) did not feel anxious. Of the 15 respondents who felt anxious, 60% (9 people) felt anxious because they were worried that they would not be able to guide students properly during online learning activities. The remaining 40% (6 people) said they were afraid of being infected by COVID-19. About 8 out of 17 respondents experienced a cut in wages due to the pandemic, but the other nine people did not experience a decrease in income. Fifteen respondents admitted to feeling bored and exhausted because of the long duration of quarantine and the remaining two people did not feel bored. Based on the results of DASS (Depression Anxiety Stress Scales)

questionnaire, it showed that, 3 out of 17 respondents (17.6%) experienced symptoms of moderate anxiety, one person (5.9%) experienced symptoms of moderate stress, and three people showed signs of mild depression.

The manifestation of anxiety included in DASS questionnaire items consists of somatic symptoms and psychological symptoms. Somatic symptoms consist of experiencing dry lips, shortness of breath, feeling unstable, feeling weak like about to faint, over sweating, difficulty swallowing (dysphagia), heart palpitations, and trembling hands. On the other side, psychological symptoms consist of anxious feeling, afraid for no reason, panic attack, and feeling worried about incidents that can cause panic.

Manifestations of stress include cognitive responses, emotional responses, behavioral responses, and affective responses. Cognitive responses include feelings of irritability, feeling exhausted due to anxious feeling, and difficult to calm down after feeling upset. Emotional response is characterized by feeling very irritable and angry because of trivial things. Behavioral response consists of overreacting to a situation, difficult to relax, difficult to rest, feeling restless very easily, could not tolerate everything that interferes with activity. Whereas, affective response included feeling impatient with matters related to delays such as congestion and queues, and impatient in dealing with disturbances.

Manifestations of depression include emotional symptoms, cognitive symptoms, and vegetative symptoms. Emotional symptoms include feeling sad and depressed, could not feel positive, think that life is useless, feeling hopeless and sad, and think that life is meaningless. Cognitive symptoms are characterized by feelings of worthlessness, feeling hopeless, difficult to increase initiative in doing something. Moreover, vegetative symptoms include losing interest in anything, could not feel

pleasure, feeling weak to do an activity, and not being enthusiastic about anything.

Table 2. Coping Strategy

Coping Strategy	Total	%
Problem-Focused Coping (PFC)	7	41.2%
Emotion-Focused Coping (EFC)	10	58.8%
Total	17	100%

Based on Table 2, in overcoming the symptoms that arise from psychological distress, respondents tend to use the Emotion-Focused Coping (EFC) strategy, as many as 10 people (58.8%). Otherwise, seven people (41.2 %) tend to use Problem-Focused Coping (PFC) strategy.

Table 3. Sub-Coping

Coping	Sub=Coping	%
PFC	Planful Problem Solving	79,90
	Confrontative Coping	54,90
	Seeking Social Support	57,84
EFC	Distancing	72,55
	Self-Control	62,82
	Escape/Avoidance	70,40
	Accepting Responsibilities	79,41
	Positive Reappraisal	55,04

Based on Table 3, scoring was conducted to determine the type of sub-coping most frequently used by respondents. The percentage of each sub-coping is obtained from the total number of respondents in the sub-coping and divided by the maximum score in the sub-coping. Based on the data obtained, the most frequently used sub-copings were Planful Problem Solving from PFC coping strategy and Accepting Responsibility from EFC coping strategy

with almost the same percentage values, 79.90% and 79.41%, respectively. The second rank sub-coping most frequently used by respondents is Distancing (72.55%), then the third rank is Escape/Avoidance sub-coping (70.40%), the fourth and fifth ranks are Self-Control (62.82%) and Seeking Social Support. (57.84%).

DISCUSSION

Description of Psychological Perceptions of YPPM Al Muttaqien Teachers

Based on the results of the study, 88% of respondents admitted to feel anxious about the COVID-19 pandemic. As educators, 60% of respondents feel anxious because they are worried about not being able to guide students properly during online learning activities, and the remaining 40% feel anxious because they are afraid of being infected by COVID-19. During the pandemic, the teachers and staff of Al-Muttaqien Modern Islamic Boarding School Foundation carried out all activities from home; so, based on considerations made by foundation officials, some teachers experienced salary cuts or a decrease in income by as many as eight people. The duration of activities at home during the pandemic certainly caused a feeling of boredom and exhaustion for respondents, 15 out of 17 respondents said they felt bored because of the long duration of quarantine.

The results of this study are in line with another research on the symptoms of elementary school teacher exhaustion during the COVID-19 pandemic which was carried out in the West Java region. The results of this study indicate that the symptoms of exhaustion experienced by elementary school teachers during the pandemic are in four aspects: physical exhaustion, intellectual emotionality, and loss of or low motivation. In addition, the study indicates that there is a dynamic of exhaustion in every aspect and it showed the symptoms progressing from low

to higher levels of exhaustion during the COVID-19 pandemic.

In the psychological perception questionnaire, respondents hoped that learning activities can be carried out face-to-face and return to normal as before the pandemic. Several other respondents hoped that the students would remain enthusiastic and able to receive lessons well even though the learning process was carried out online. The psychological perception questionnaire also contains questions about respondents' expectations of the COVID-19 pandemic. All respondents hoped that pandemic will end soon and daily activities can be carried out normally again, especially learning activities at school.

Description of Psychological Distress of YPPM Al-Muttaqien Teachers

Based on the results of the study, respondents R3, R5, and R15 experienced moderate levels of anxiety. The three respondents felt symptoms of excessive anxiety and worry, felt scared and easily panicked, dry lips, felt shaky legs, and felt weak as if they were about to faint. Respondents R3 and R15 experienced difficulty in breathing, often gasping, difficult in swallowing, heart palpitations even though they did not do physical activity, and trembling. In addition, only respondent R3 experienced symptoms of excessive sweating. The anxiety manifestations described on the DASS questionnaire were consistent with symptoms of anxiety according to Conley (2006). Somatic symptoms consist of excessive sweating, tension in the skeleton muscles, hyperventilation syndrome, gastrointestinal dysfunction, cardiovascular irritability, genitourinary dysfunction. Psychological symptoms include mood disorders, sleep disorder, fatigue, loss of motivation and interest, very sensitive, restless, unable to concentrate, bothersome fear and doubt.

Respondent R15 showed signs of moderate stress with a score of 19. Signs of stress felt by R15 were irritability due to trivial things, irritability, impatience, difficult in calming down; these symptoms were often felt by respondent R15. In addition, they also felt that they were overreacting to something, excessively anxious, had difficulty resting, and were sometimes easily agitated. The stress manifestation in the DASS questionnaire is in line with the opinion of Videbeck (2008) which states that stress can produce various responses such as cognitive, emotional, behavioral, and affective responses. Cognitive responses include symptoms such as disruption of individual cognitive processes such as chaotic thoughts, unable to concentrate, repeated and unnatural thoughts characterized by anxiety feeling and fear of negative judgments from the environment, fear of being insane, and so on. Emotional responses are characterized by feelings of anger, behavioral responses in the form of feelings of restlessness, nervousness, pacing (unable to relax). Meanwhile, the affective responses are characterized by feelings of impatience and easily frustrated.

R2, R13, and R15 experienced mild depression. The three respondents sometimes felt that nothing could be expected in the future, felt sad and depressed, felt worthless, lost interest or felt unenthusiastic in everything, and difficult to increase initiative in doing things. Respondents R13 and R15 experienced feeling of not being able to think positive, Respondents R2 and R15 sometimes felt no longer strong enough to carry out an activity. In addition, respondents R2 and R13 sometimes felt that life is not useful, feel sad and hopeless, and sometimes feel that life is meaningless. The manifestations of depression on the DASS questionnaire are in line with Kaplan and Sadock (2010) who state that the signs and symptoms of depression disorders are the change in activity levels, cognitive abilities, speech, and vegetative functions such as lethargy and lack

of energy, sleep disorder, loss of desire and appetite, and sexual activity.

There are no studies that discuss about the incidence of anxiety, stress, and depression that are specifically targeted at teachers in the midst of the COVID-19 pandemic. But there is a survey on mental health during the pandemic conducted by the Association of Indonesian Mental Medicine Specialists among respondents aged 14-71 years spread across Java. The survey results showed that as many as 63% of respondents experienced anxiety due to COVID-19 with signs of feeling of worry that something bad will happen, excessive worry, irritability, and difficult in relaxing. The survey results also showed that 80% of respondents had symptoms of psychological post-traumatic stress due to experiencing or witnessing unpleasant events related to COVID-19. Some 46% of respondents experienced severe post-traumatic stress symptoms, 33% of respondents had moderate post-traumatic stress symptoms, 2% of respondents had mild post-traumatic psychological stress symptoms, and the remaining 19% showed no signs of stress. The post-traumatic stress symptoms that stand out are feeling distant and separated from others and feeling constantly alert, careful, and vigilant. In addition, 66% of respondents experienced depression due to COVID-19c. The main symptoms of depression that appeared are sleep disorder, feeling insecure, tiredness, and feeling unenthusiastic or losing interest.

A study conducted among residents of Uttar Pradesh state of India revealed that COVID-19 is creating psychological distress among individuals, as there are restrictions due to lockdown and people are forced to stay home. Individuals are going through a crisis situation and feeling lack of control in their lives due to lockdown and restrictions imposed upon them. Young adolescents and adult age group are facing uncertainty with respect to career and professional life, jobs are at stake. Fear of infection is creating a

panic situation among them (Kazmi et al., 2020).

Description of Coping and Sub-Coping Strategies of YPPM Al-Muttaqien Balikpapan

Based on the results of the Ways of Coping questionnaire from this study, it can be seen that, in controlling psychological distress, some of the respondents tended to implement the EFC coping strategy, as many as 10 people (58.8%), and the remaining seven people (47.2%) tried to control psychological distress with PFC coping strategies.

According to Ben-Zur (2017) coping strategies that focus on emotions can be effective in reducing stress. However, it depends on the environmental aspects that cause stress, such as in circumstances that cannot be controlled by the individual. Many other studies have stated that there is no individual tendency to use only one type of coping strategy but use a combination of both.

Furthermore, based on the research results, it can be seen that the most often implemented sub-coping by respondents are the planful problem solving (79.90%) from PFC coping strategy and the accepting responsibility (79.41%) from EFC coping strategy. In Problem-Focused Coping, respondents cope with stress by changing conditions that are considered to be stressful in a careful, gradual, and analytical way. Meanwhile, in Emotion-Focused Coping strategy, respondents cope with stress by trying to be aware of their own responsibility in the problems they face and try to accept the situation.

In controlling psychological distress, by using planful problem solving sub-coping, respondents tried to focus and concentrate on doing tasks. Based on the results, 9 out of 17 respondents always implement it to control stress or feelings of pressure; 8 out of 17

respondents always make problem-solving plans and follow the plans that have been made; 7 out of 17 respondents always make changes to improve things; 10 out of 17 respondents always look at past experiences and take lessons to practice them; 10 out of 17 respondents always go the extra mile to solve ; and 4 out of 17 respondents admitted that they always have various alternative solutions to the problems they are facing.

In accepting sub-coping, 13 out of 17 respondents often recall important things in life. Eight respondents admitted that they often try to change to be a better person; 11 out of 17 respondents said they always pray to God to make things better; and 8 out of 17 respondents always hope for a miracle so that the problem can be resolved.

The second rank of the most often used sub-coping is distancing (72.55%); respondents try to avoid problems as if nothing happened or avoid things that can cause problems, such as admitting mistakes, not being rushed while taking action, being introvert so that others do not know bad things are happening to the respondent, always thinking before speaking and taking action to avoid making the same mistake. In the third to fifth rank, the most frequently used sub-coping are escape/avoidance (70.40%), self-control (62.82%), and seeking social support (57.84%).

From the description above, it can be concluded that the use of coping strategies cannot be separated between Problem-Focused Coping and Emotion-Focused Coping. The respondents often use both coping strategies or several sub-copings at the same time. This depends on experience, culture, and knowledge of the respondent.

CONCLUSION

The majority of respondents were female (82.4%), the age distribution was dominated by young adults (52.9%), and the marital status of the respondents was mostly

married (64.7%). The distribution of respondent occupations consisted of two school principals, 13 teachers, one administrative staff, and one had a role for three occupations, as a teacher, administrative staff, and school operator. As many as 47.1% of respondents worked as teachers for less than five years, 23.5% of respondents worked for more than 10 years, and 23.5% of respondents worked for 5-10 years. There was only one respondent who has an income above the minimum wage.

From 17 respondents, 15 claimed to feel anxious due to the COVID-19 pandemic. Of the 15 respondents who felt anxious, 60% (9 people) felt anxious because they were worried that they would not be able to guide students properly during online learning in the midst of the COVID-19 outbreak, and the remaining 40% (6 people) felt anxious because they were afraid of being infected by COVID-19.

Based on the results of DASS questionnaire, three respondents showed the symptoms of moderate anxiety, one person showed the symptoms of moderate stress, and three people showed the symptoms of mild depression. Based on the results of descriptive analysis, of the 15 respondents who felt anxious about COVID-19 outbreak, three (20%) of them experienced moderate anxiety, one person (6.67%) experienced moderate stress, and two people (13.33%) had mild depression. Of the two respondents who admitted that they were not anxious about COVID-19, one person (50%) showed the symptoms of mild depression.

The manifestations of anxiety that were felt by respondents included somatic symptoms and psychological symptoms. The manifestations of stress consist of cognitive, emotional, behavioral, and affective responses, while the manifestations of depression consist of emotional, cognitive, and vegetative symptoms.

The majority of respondents tended to use the Emotion-Focused Coping strategy

(58.8%), as many as 10 people, and the remaining seven people (41.2%) used the Problem-Focused Coping strategy to control stress during the COVID-19 pandemic. The most frequently used sub-coping was playful problem solving and accepting responsibility with almost the same percentages, namely 79.90% and 79.41%, respectively.

This research is only limited to the description of distribution of each variable, so a deeper study is needed regarding the factors that influence the incidence of anxiety, stress, and depression in teachers who are carrying out online learning amid the COVID-19 pandemic and the factors that influence respondents in choosing coping strategies, such as educational, cultural, social factors, and the level of religiosity, by considering that the research targets have a religion-based background. In addition, data collection in this study was carried out online, so there is a possibility that the respondents answered the questionnaire incorrectly.

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EFFECT OF EDUCATION ON KNOWLEDGE, ADHERENCE, AND INTRAOCULAR PRESSURE ON GLAUCOMA OUTPATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction: To evaluate educational interventions to improve patient knowledge, and adherence to glaucoma treatment that results in a reduction in intraocular pressure based on current clinical evidence. **Methods:** A systematic review of PubMed (NIH) was conducted to identify studies evaluating educational interventions to improve patient knowledge, and adherence to glaucoma treatment that resulted in decreased intraocular pressure. The search was conducted from March to August 2020. **Results:** The educational intervention was successful in increasing the skill of using eye drops for one month from 6% to 35%, and 64% after six months of education. The percentage of patients who successfully implanted the eye drops correctly increased from 66.7% to 82.2%. The educational intervention was successful in increasing adherence to treatment followed by MEMS from 67% -98% to 78% -86%. The adherence monitored with the pharmacy database resulted in a PDC of 57%, and the medication possession ratio (MPR) of 71% because many data were not recorded in the pharmacy. African American patients had significantly low adherence (OR = 0.29 95% CI = 0.16, 0.52). The educational intervention has no significant effect on the IOP value. Patients with low adherence tend to have low VFQ-25 (visual acuity) scores. After education, 99% of the patients were satisfied with the health program implemented. **Conclusion:** All educational interventions were successful in increasing patient knowledge, medication adherence, and eye care medical visits. Educational interventions did not significantly affect IOP values. Patients who are not adherent tend to have low visual acuity.

Keywords: glaucoma, education, knowledge, adherence, intraocular pressure

INTRODUCTION

Glaucoma is a disease that attacks the nerves of the eye slowly and blindness can last forever. In 2011, open-angle glaucoma occurred in about 60 million people and blindness in both eyes was estimated to occur in 4.5 million people in 2010 and to 5.9 million in 2020 (Jr et al., 2015). The cause of blindness in glaucoma is undiagnosed, not treated properly, and low therapeutic adherence (Jr et al., 2015). The prevalence of glaucoma is known to be age-related and increases with the aging of the population. The majority of glaucoma cases worldwide remain undiagnosed or under-managed, particularly in many developing countries for multi-factorial reasons (Choi et al., 2013; Mostafa et al., 2019). Research in the United States shows that glaucoma is more common among African-Americans (Sleath et al., 2018).

Progressive vision loss in glaucoma can be slowed by lowering the intraocular pressure (IOP) through drugs, laser treatment, or incision surgery (Wang et al., 2018). Non-adherence to medication may be caused by not getting a prescription, not taking medication, missing doses, taking the wrong amount of medication, not taking medication on time, taking medication not according to doctor's instructions (for example with or without food) and stop taking medication temporarily or forever (Bazargan et al., 2017; Al-sharqawi and Bayoud, 2018).

Previous studies have shown that medication adherence can be improved with educational interventions with limited discussion (Newman-Casey et al., 2017), and visual impairment on the quality of life for glaucoma patients (Quaranta et al., 2016). We identified that a successful health program is likely one that can increase patient knowledge of glaucoma

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and the risks associated with non-adherence against the treatment. Glaucoma is a group of progressive optic neuropathy and is associated with a high level of intraocular pressure (IOP) (Jr et al., 2015). In chronic disease treatment effects require long-term observation, so an observational design is more appropriate than a randomized study (Al-sharqawi and Bayoud, 2018). In this literature review, it is considered to review the provision of education to provide understanding and knowledge regarding glaucoma disease and its treatment with adequate follow-up, which is expected to produce relevant findings as a guide in the clinical practice of glaucoma treatment.

This literature review aims to identify and evaluate studies examining educational interventions on patient knowledge, and adherence to glaucoma treatment that resulted in decreased intraocular pressure as a reflection of glaucoma progression.

METHODS

The study was approved by the Institutional Ethical Committee University of Surabaya (approval number 151/KE/III/2021).

Literature Search

A literature search was carried out using a database from PubMed (NIH) to search available research articles from March to August 2020. The terms and titles of medical subjects (MeSH) used are: "glaucoma" and "education" and "knowledge" and "adherence" and "intraocular pressure." The search was carried out by taking into account the synonyms of medical subjects (MeSH) keyword and title as follows: 1. "Glaucoma" AND (as topics used "patient education" or "intervention education"), 2. "Glaucoma" AND (as topics used "increase knowledge" or "patient knowledge"), 3. "Glaucoma" AND (as topics used "medication adherence," or "compliance

medication," or "self-management"). 4. "Glaucoma" AND (as topics used "decrease intraocular pressure" or "intraocular pressure reduction").

Study Selection

Evaluation of research titles and abstracts is carried out by a researcher to determine their eligibility for this study. The inclusion criteria used are as follows: articles are in English or have published English translations, evaluation of the effect of education in glaucoma patients, patient knowledge, medication adherence, and intraocular pressure (IOP) as the main outcome and as a secondary outcome whether there is an assessment of patient satisfaction, research published in the last five years (2015 to 2020).

The exclusion criterion was the effect of education on glaucoma patients, children, and adolescents.

Data Extraction

Data extraction was carried out by the main researcher and the results were consulted with two other researchers. Data were extracted from research articles using a data collection form, which included: author, study design, sample (number, type of glaucoma), intervention, intervention results, and study quality (Jadad score for RCT study and Newcastle-Ottawa score for observational study).

Assessment of Outcome Measures

One researcher assessed the outcome measures and the results were confirmed with two other members to reduce subjectivity. The assessment was carried out by classifying the effect of education on patient knowledge, adherence to glaucoma treatment, and intraocular pressure (IOP) as the main outcome.

National Eye Institute Visual Functioning Questionnaire-25 (NEI-VFQ-25) was used to assess visual function and or the GSS (Glaucoma Symptom Scale) questionnaire (Quaranta et al., 2016). The NEI-VFQ-25 score correlates with visual

acuity. Eyes with the more severe diseases tend to have low scores (Quaranta et al., 2016). GSS questionnaire was used to assess 10 non-visual ocular complaints such as burning/stinging/stinging and visual ones such as blurred/dim vision, difficulty seeing during the day, and difficulty seeing in the dark (Quaranta et al., 2016).

Assessment of patient satisfaction in glaucoma treatment was assessed using a treatment questionnaire designed to assess patient satisfaction with topical eye treatment. Patient satisfaction was correlated with the patient's view of drug use, eye irritation, conjunctival hyperemia, ease, and comfort of the patient toward treatment (Quaranta et al., 2016).

Research Quality Assessment

Assessment of research quality for randomized controlled studies (RCT) used the modified Jadad (Oremus et al., 2012) score and the modified Ottawa-Newcastle score for observational research (Riera-guardia et al., 2014).

The Jadad modification score was used to evaluate the quality of the study using a five-point scale and each point was awarded for the following criteria: whether the study was randomized, whether there is an appropriate description of the missing subject is followed up, and whether the study was double-blind (provider and patient were not aware of the intervention). If adherence is measured by pharmaceutical refill or electronic monitoring two points are awarded. If adherence is measured by self-report, no points are awarded.

The Newcastle-Ottawa score is a five-point scale that includes: does the cohort represent the appropriate population, how to ascertain the condition of the disease (e.g. through medical records or self-reports), whether the outcome assessors were blinded to the status of care, whether the length of follow-up was appropriate (≥ 6 months), whether there was a suitable description for patients who were lost to follow-up.

Assessment of the quality of the research was carried out by one researcher, and, to reduce subjectivity, the results of the assessment were consulted with two other researchers.

RESULTS

The search returned one hundred, and twelve unique references. Fifty-four research articles were evaluated for potential relevant results. Twenty research articles were identified as relevant for inclusion in this systematic review article. The procedure for selecting articles is depicted in Figure 1. The studies consisted of seven randomized controlled trials (RCTs), and thirteen observational studies.

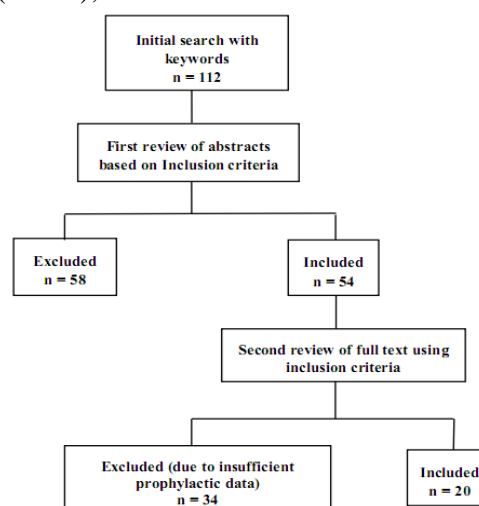


Figure 1. The process of selecting articles for literature review

There are seven RCT studies, two showed an increase in knowledge, and five studies showed an increase in adherence after an educational intervention. Of the thirteen observational studies, four showed increased knowledge, and two showed increased adherence (Table 1).

Randomized Controlled Trial (RCT)

Cook et al. (2018) conducted a study to test interventions that would have a greater effect on treatment adherence against glaucoma patients. All participants received a drug event monitoring system (MEMS) vial for the collection of

adherence data. The result is call reminders are better at improving medication adherence than usual care. Interview motivation (MI), and usual care did not differ significantly in improving treatment adherence (Cook et al., 2018).

An RCT study was conducted by Lampert et al. (2019) to test the individual skills of administering eye drops, and administering special counseling. Patient education through demonstration of eye drop administration, and counseling by pharmacy staff has been shown to improve eye drop administration skills (Table 1) (Lampert et al., 2019).

Myers et al. (2016) conducted a study to assess adherence to eye drop treatment using Travoprost Dosing Aid (TDA). Adherence was not statistically different between the functional TDA, and the TDA without alarm groups. The increase in adherence in patients who felt monitored was not statistically significant (Myers et al., 2016).

A study was conducted by Hark et al. of patient navigators in a prospective, randomized, controlled intervention with urban patients versus patients working in offices. There was no statistically significant difference in the level of follow-up visit adherence in urban patients and those who worked in offices with patient navigators or not (Table 1) (Waisbourd, 2016).

Cook et al. (2016) identified various variables that may be associated with glaucoma adherence. Compliance was monitored using a MEMS (Medication Event Monitoring System) bottle. The greatest predictors of adherence were self-efficacy, motivation, a larger number of doses per day, and race (Cook *et al.*, 2016).

In a study conducted by Murdoch et al. (2020) on open-angle glaucoma (POAG) patients in Kenya, patients received counseling about glaucoma, therapeutic goals, and drop technique. The weighing of the bottles was carried out before and after being given to the patient and the difference in the weight of the bottles was used to

calculate the amount of medicine used by the patient. Treatment adherence reports vary because of different adherence assessment methods (Murdoch et al., 2020).

Waterman et al. (2018) conducted an RCT study in the United Kingdom (UK) to evaluate information during a nurse-conducted glaucoma consultation. Group-based education provided by nurses can be accepted by patients, and provides information about glaucoma health (Waterman et al., 2018).

Observational Studies

The level of adherence to treatment of glaucoma patients in a community pharmacy was evaluated by Feehan et al. (2016). Adherence rates used standard metrics to determine the number of days covered for treatment (PDC) and the ratio of drug ownership (MPR). Treatment adherence was evaluated using drug refill data in pharmacies showing a very high non-adherence rate (Table 1) (Feehan et al., 2016).

Fudenberg et al. conducted a study to compare the adherence rates of patients diagnosed with glaucoma in two clinics. Patient CPEC clinic schedules appointments with automatic phone call reminders three days before appointment, and resident glaucoma clinic without call reminders were examined. There were no significant differences in treatment adherence between patients who received phone calls, and those who did not (Lee et al., 2016).

Compliance with glaucoma treatment measured through the use of drugs (MEMS) and the quality of vision through VRQoL scores has been evaluated by Thompson et al. (2018). Non-adherent patient MEMS had lower VRQoL values for glaucoma treatment than adherent patients. Eye drop non-adherence was associated with eye pain, and a low VFQ-25 score (Thompson et al., 2018).

Sleath et al. (2016) evaluated the relationship between glaucoma education and its treatment, patient questions, self-

efficacy, expectations of the results of treatment compliance. If the provider educates the patient about eye drop administration, and self-efficacy toward glaucoma treatment, it is associated with a positive association with treatment adherence (Sleath et al., 2016).

The study conducted by Carpenter et al. (2017) evaluated whether service provider communication improved the self-efficacy of treating glaucoma patients. Patients get high self-efficacy if the doctor educates glaucoma, perception of glaucoma, and how to treat it (Carpenter et al., 2017). Research on the feasibility of health development of glaucoma patients conducted by Vin et al. (2015) found health coaching has the potential to improve the treatment of patient glaucoma and health. Factors that influence include age, gender, personality, and cognitive function (Vin et al., 2015).

Treatment compliance based on the reconciliation of electronic medical record data was evaluated by Bacon et al. Treatment compliance was determined by the consistency of the patient drug regimen, electronic medical record data, and doctor's plan on the previous drug regimen. If patient inconsistency occurs, it is better to follow the doctor than medical record data (Press, 2016). Sayner et al. (2017) evaluated by recording a patient's medical visits to an eye clinic on video recordings. The patient's factors affect his ability to administer the drops. There is opportunity for pharmacists to have a positive effect on glaucoma, because doctors rarely provide continuous education and patients have difficulty managing their eye drops (Sayner et al., 2017). Al-Owaifeer et al. (2018) in Saudi Arabia evaluated educational intervention on knowledge of glaucoma and the factors that influence it through brief videos of glaucoma education. The use of video as an educational tool can increase short-term knowledge in glaucoma patients (Al-Owaifeer et al., 2018). Health program eligibility (GOAL)© for glaucoma treatment adherence in African-American

patients was evaluated by Dreer et al. Before the research, the patient was trained to use electronic TDA. A culturally packed health promotion program (GOAL ©) can improve glaucoma treatment adherence in African-American patients with open-angle glaucoma who are suspected of having low adherence (Acceptability and Informed, 2016).

Sleath et al. (2015) evaluated the compliance with glaucoma treatment electronically through resources and support providers in self-management when interacting with patients. Compliance with glaucoma treatment increases if the provider has a positive influence and educates patients about glaucoma and treatment (Sleath et al., 2015).

Lazcano-Gomez et al. evaluated the effect of planting eye drops. So determine the patient results in the right technique, 30 minutes later the patient was evaluated to see the effectiveness of the training. The single educational session using eye drops was successful in improving eye drop administration, but the effect of long-term education could not be evaluated (Assessment, 2015). The effect of the EQUALITY telemedicine eye health education program on the knowledge of patients at risk of glaucoma, and their attitudes to eye care was evaluated by Rhodes et al. (2016) in the Alabama region, USA. Increasing patient knowledge about glaucoma and attitudes toward eye care in risk groups can increase early detection, and thus reduce blindness (Rhodes et al., 2016).

Result Assessment

In all of the seven RCT studies, three used electronic drug monitoring (MEMS) to monitor patient adherence. Three studies used self-reporting, and one study used pharmaceutical data to monitor treatment adherence.

In observational studies, five studies used electronic monitoring (MEMS) to measure adherence, one study used drug dispensing records, and seven

studies used self-reporting. Of the twenty studies identified three studies did not measure the patient's intraocular pressure, namely the study conducted by Lampert et al. Evaluating the effectiveness of counseling and the use of eye drops in a pharmacy, Feehan et al. evaluated patient compliance using a pharmacy database. Bacon et al. evaluated compliance with drug regimen data (Table 1).

Three studies assessed patient satisfaction with treatment, the study by Cook et al. (2016) compared patient satisfaction with usual care, a combination of regular care with counseling, and regular care with call reminders. Research conducted by Rhodes et al. assessed patient satisfaction with the telemedicine program (EQUALITY) Cook et al. (2016) and Rhodes et al.'s studies assessed patient

satisfaction with a self-developed questionnaire, whereas Dreer et al. assessed the satisfaction of patient education programs with problem-solving counseling and training using the Glaustat questionnaire.

Research Quality

Overall, of the twenty studies identified, the quality of the studies was good (Table 1). Of the seven RCT studies, there were three studies with a Jadad score of 3/5, because the study used its measurement for adherence. Of the thirteen observational studies, four studies scored Newcastle-Ottawa score of 3/5 because in the study the length of follow-up was less than six months, and the outcome assessors were not blinded in treatment.

Table 1. Summary of extraction results for each study

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
Cook et al., 2017	RCT	201 patients open-angle glaucoma and OHT	-regular maintenance -regular maintenance + MI -regular maintenance + phone calls	Adherence: Call reminders improved adherence higher than usual care with MEMS measurements, p = 0.005, with self-measurements p = 0.04. Satisfaction: Patient satisfaction was higher at MI than on call reminders p = 0.007. Reminder calls and usual care had the same satisfaction p = 0.10.	Jadad score: 4/5
Lampert et al., 2019	RCT	152 patients at 28 community pharmacies.	60 minutes of eye drop counseling and training vs. 120 minutes	Knowledge: Eye drop education increased administrative skills from 6% at baseline after 1 month to 35% (P≤ 0.001), after 6 months to 64% (P ≤ 0.001)	Jadad score: 3/5
Myers et al., 2016	RCT	45 glaucoma patients Group 1: 20 patients	Fully functional TDA (visual alarm, sound dose reminder, drop recording) Vs TDA inactive	Adherence: Adherence for functional TDA: 78% (95% CI: 70% -80%).	Jadad score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
		with fully functional TDA Group 2: 20 patients with TDA only recorded active dose use. Group 3: 5 patients with disabled TDA.		Adherence for inactive TDA: 76% (95% CI: 65% - 89%). In the group of patients without an alarm, the odds ratio for adherence was higher. Patients reported that the use of TDA affected the use of eye drops.	
Hark et al., 2016	RCT	155 glaucoma patients Group 1: 53 patients (community-based eye clinic + navigator) Group 2: 57 patients (office-based eye clinic + navigator) Group 3: 45 patients (office-based eye clinic without a navigator)	Patient navigators in urban community settings vs office-based settings (regular care)	Adherence: Adherence for one follow-up visit G1 = 69.8%, G2 = 82.5%, G3 = 73.3% (p = 0.28). Adherence for ≥ 2 follow-up visits G1 = 91.3%, G2 = 74.3%, G3 = 66.7% (p = 0.11). IOP and visual acuity: NEI-VFQ-25 mean values (scale 1-100): G1: 83.98 \pm 14.75; G2: 80.97 \pm 15.85; G3: 77.29 \pm 20.92	Jadad score: 3/5
Cook et al., 2015	RCT	201 glaucoma patients	-regular maintenance - call reminder -motivational counseling	Adherence: Self-report compliance measures: 94.1% and MEMS: 78.5%. The bivariate correlation between the 2 compliance measures rs = 0.31. Predictors of compliance with MEMS: self-efficacy,	Jadad score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
				motivation, dosage regimen, and race/ethnicity and affect variability as much as 35% in adherence. Predictors of adherence based on self-reports: self-efficacy and intention to comply accounted for 20% of the variability in adherence.	
Murdoch et al., 2020	RCT	11 patients glaucoma (POAG)	Glaucoma counseling, therapeutic goals, and eye drop technique.	Adherence: 45% of patients fail to complete 1 full year of topical therapy. 55% completed 1 year of follow-up and controlled IOP at each visit. Number of drugs that have been successfully infused per day: 1.74 (SD 0.69).	Jadad score: 4/5
Waterman et al., 2018	RCT	9 nurses and 112 glaucoma patients (OAG, OHT, normal tension glaucoma)	Nurse training to provide group-based education to glaucoma patients in 3 educational phases.	Knowledge: Information provided by nurses to patients in phase 1 and phase 3: -self-management (importance of taking eye drops: 83% and 100%. -Treatment (eye drop option): 60% and 100%. -Drug side effects: 43% and 100%. -Prognosis (if treated mostly do not become blind): 3% and 100%. -Time to lose sight: 2% and 6%.	Jadad score: 3/5
Feehan et al., 2016	Observational	3615 glaucoma patients	Drug expenditure data were analyzed by the number of days covered by treatment (PDC) and comparison of drug ownership (MPR)	Adherence: 1-year compliance rate for proportion of days covered (PDC): 57% and drug ownership ratio (MPR): 71%. The proportion of PDC and MPR with satisfactory adherence increased at > 65 years (P <0.001). The highest adherence to α 2-adrenergic PDC:	New Castle - Ottawa score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
				36%, MPR: 47.6%. The use of cholinergic agonists obtained PDC: 25.0% and MPR: 31.2%, for combination products PDC: 22.7% and MPR: 31.0%.	
Fudemb erg et al., 2016	Observati onal	295 patients were divided into: 144 glaucoma clinic patients and 151 patients in the CPEC clinic	Phone call reminder (CPEC clinic) Vs without reminders for medical visits (glaucoma clinic)	Adherence: Patients with call reminders (65.6%) and no receive (68.1%) did not differ significantly in treatment adherence; OR = 1.35 (CI = 95%; 0.79-2.32, P = 0.28). Adherence was higher at 50-80 years of age than at <50 years and > 80 years, P = 0.02.	New Castle - Ottawa score: 4/5
Thomson et al., 2018	Observati onal	79 open-angle glaucoma (OAG) patients.	Use of eye drops with MEMS electronic monitoring and filling out the National Function Institute Questionnaire-25 (VFQ-25) questionnaire	Adherence: 30% of patients took glaucoma medications <80% of the prescribed dose. IOP and visual acuity: Non-adherent patients had lower VFQ-25 scores 70.66 ± 20.50 Vs 75.91 ± 19.12 , SMD = 0.27 and after 3 years 71.68 ± 21.93 Vs $76.25 \pm 21, 67$, SMD = 0.21.	New Castle - Ottawa score: 4/5
Sleath et al., 2015	Observati onal	279 glaucoma patients from 6 eye clinics	Videotaped medical and communication variability	Adherence: African-American patients had significantly lower adherence than non-African-Americans (OR = 0.37, 95% CI: 0.16, 0.86). Patients use the correct dosage regimen every day if they receive education from a doctor ($\beta = 0.18$, P = 0.008).	New Castle - Ottawa score: 3/5
Carpenter et al., 2016	Observati onal	279 glaucoma patients and 15 ophthalmologists	Videotaped medical visits of patients and ophthalmologists.	Adherence: If the provider educates the patient about glaucoma, there is an increase in self-confidence toward treatment ($\beta = 0.35$, P <0.001).	New Castle - Ottawa score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
				African-American patients experienced lower self-adherence barriers than non-African $\beta = 2.15$, $P < 0.05$. Women reported less self-efficacy than men $\beta = 0.63$, $P < 0.05$.	
Vin et al., 2015	Observational	4 glaucoma patients	Health coaching for 3 months with a health behavior change methodology	Adherence: MEMS treatment adherence at study entry: 67% - 98%, post-training adherence: 78% - 86%. Health coaching is beneficial and recommended for families with glaucoma.	New Castle - Ottawa score: 3/5
Bacon et al., 2016	Observational	160 glaucoma patients	- the patient's stated drug regimen - prescribed drug regimens - electronic medical record of patient treatment	Adherence: If there is a difference in data between what the doctor stated and the medical record, the patient follows the doctor: 72.5%; does not follow: 20%. Adherence did not differ based on sex ($P = 0.912$) and the number of drugs taken ($P = 0.242$). Adherence by race for Caucasians 91% ($P = 0.31$), African-Americans 83% ($P = 0.54$), Hispanics 81% ($P = 0.58$).	New Castle - Ottawa score: 3/5
Sayner et al., 2016	Observational	279 patients from 6 eye clinics and 15 ophthalmologists	Video recording of interview and demonstration of correct eye drop method	Knowledge: Patients with higher education were more appropriate to instill one drop in the eye $P = 0.017$. Women tended not to properly instill one drop in the eye $P = 0.026$.	New Castle - Ottawa score: 4/5
Al-Owaifer et al., 2018	Observational	196 glaucoma patients	Short educational video on glaucoma knowledge	Knowledge: Pre-intervention knowledge: 6 on a scale of 17 and post-intervention to 11.1 on a scale of 17. Knowledge before and after the intervention was significantly different P	New Castle - Ottawa score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
				<0.001. Good predictors of knowledge: age <60 years, male, higher education, living in urban areas, high income, and family history of glaucoma.	
Dreer et al., 2016	Observational	11 glaucoma patients, African-American	Educational programs, motivational interviews (MI) and problem-solving training on glaucoma treatment	Adherence: Treatment adherence significantly increased $t(10) = -2.55$, $P < 0.03$, significant improvement for glaucoma management self-efficacy $p = 0.03$, ease of use of eye drops $P = 0.02$. IOP: There is no difference between emotional health and IOP. Satisfaction: Improvement in treatment satisfaction $P = 0.05$, confidence in the need for glaucoma medication $P = 0.05$ and visual ocular functional symptoms.	New Castle - Ottawa score: 3/5
Sleath et al., 2015	Observational	279 glaucoma patients in 6 eye clinics and 14 ophthalmologists	Video recording of patient medical visit interview about glaucoma treatment	Adherence: The adherence of African-American patients was smaller than that of non-African-Americans (OR = 0.29 95% CI = 0.16, 0.52) Patients with many types of drugs tended not to take their doses on time (OR = 0.62, 95% CI = 0.39, 0.98) Patients tended to be adherent if the provider gave positive reinforcement of drug use (OR = 3.37 95% CI = 1.69, 6.71) and if the provider educated the patient (OR = 1.35 95% CI = 1.03, 1.78).	New Castle - Ottawa score: 4/5

Author, Year	Design study	Sample	Intervention	Outcome	Quality study
Lazcano-Gomes et al., 2015	Observational	45 glaucoma patients	Educational video for the correct use of eye drops	Knowledge: Before giving education: the average number of drops infused was 1.5 ± 0.9 ml, and after education, the number of drops planted was 1.2 ± 0.5 ml (P = 0.011). The percentage of patients implanting 1 drop correctly increased from 66.7% to 82.2%.	New Castle - Ottawa score: 4/5
Rhodes et al., 2016	Observational	518 glaucoma patients (glaucoma, OHT, POAG)	Telemedicine EQUALITY education about glaucoma, adherence to appointments, adherence to care. Education: videos, brochures, and posters	Knowledge: There was a significant increase in positive knowledge and attitudes. Unemployment (OR = 0.63, 95% CI = 0.42 - 0.95, P = 0.026) and patients with low education level (OR = 0.55, 95% CI = 0.29-1.02, P = 0.058) there was a lower increase in glaucoma knowledge. African-Americans (OR = 0.47, 95% CI = 0.23-0.94, P = 0.035) had a lower increase in knowledge than white races. Satisfaction: After education 99% of patients are satisfied with CEE.	New Castle - Ottawa score: 4/5

DISCUSSION

Overall research was in using interventions to increase patient knowledge in the use of eye drops (Assessment, 2015; Myers et al., 2016; Thompson et al., 2018), increase adherence to medical visits (Manuscript, 2015;) Waisbourd, 2016; Cook et al., 2018), or a combination of interventions (Sayner et al., 2017; Lampert et al., 2019; Murdoch et al., 2020) by various methods. Two retrospective studies recorded drug data to assess treatment adherence.

Knowledge and administrative skills in the use of eye drops for glaucoma patients are still lacking, thus it is necessary to conduct education regarding eye drops to increase knowledge of eye drop administration. A study by Myers et al. used Travoprost Dosing Aid (TDA) to assess eye drop medication adherence (Myers et al., 2016), whereas Thompson et al. (2018) used MEMS to assess adherence. A study conducted by Lazcano-Gomez et al, educated patients on the use of video-recorded eye drops to increase patient knowledge of the use of eye drops (Assessment, 2015). Although the methods

used are different, the ultimate goal is patient adherence to glaucoma treatment. The severity of glaucoma was associated with an error of planting eye drops to resulted in pain in the eyes (Assessment, 2015).

Knowledge and medication adherence of glaucoma patients can be analyzed from the rate of medical visits to healthcare providers. The severity of glaucoma can be inhibited by patient compliance with medical visits. Several methods are used to increase compliance with medical visits including phone call reminders and motivational interviews (MI) or face-to-face counseling, patient navigators, educational and counseling video recordings, and with telemedicine. Adherence interventions are useful for maintaining existing high levels of adherence. Treatment adherence is a complex construct and the degree of non-adherence detected depends on how data are collected (Cook et al., 2018).

Patient medication adherence can also be evaluated from the medication regimen used using refill data, and electronic medical records from the pharmacy. The study conducted by Feehan et al. (2016) analyzed medication adherence by using drug refills at community pharmacies, while Bacon et al. analyzed drug reconciliation from electronic medical records (Press, 2016). Both studies resulted in an unsatisfactory patient adherence, because drug refills could be done elsewhere and there was a possibility that the patient had already received a prescription from another doctor, besides that the medical record did not reflect the most accurate and current treatment. Analysis of medication adherence with pharmaceutical refill, and electronic medical records was not a patient-centered primary study, there may be a difference between patient adherence, and medication adherence. The accuracy of eye drops is associated with drops of planting skills, the balance between eye and

hands, and sharpness of vision (Feehan et al., 2016).

Glaucoma severity is associated with an increase in TIO. Reducing IOP can prevent the development of glaucoma, insufficient IOP reduction can accelerate progression, and blindness due to glaucoma (Jr et al., 2015). The high IOP target is thought to be due to less aggressive intervention and infrequent follow-up visits (Jr et al., 2015). The success of glaucoma management from a clinician perspective is associated with IOP parameters, visual field, and progression of damage, possibly in contrast to the patient perspective. Decreased visual function of glaucoma patients can be assessed by the patient's ability to read, walk on stairs, and recognize people (Hoevenaars, 2015).

Patient satisfaction in treatment is an important factor to ensure treatment adherence (Quaranta et al., 2016). Factors associated with satisfaction include the frequency of use of eye drops, subjective comfort, and ease of administration (Hoevenaars, 2015). Patients are satisfied with the therapy, possibly due to the educational efforts undertaken by an ophthalmologist in stressing the importance of reducing intraocular pressure (IOP) in patients (Hoevenaars, 2015). Patient satisfaction with health services effects on increasing treatment compliance, active in healthcare, and continuing medical nurses (Quaranta et al., 2016).

The limitation of this study is that the literature review was carried out on one PubMed database (NIH), the possibility of related studies was found in other databases that were not identified so there was a high probability of bias in data collection. Another limitation is that the study subjects were the majority of African-American glaucoma patients in the United States, and none of the studies were representative of glaucoma patients from Asia. Data on the prevalence of glaucoma incidence in the Asian region cannot be estimated because of the limited number of published studies. Further research needs to be carried out by

analyzing data from more databases as a source of literature so that more research can be identified with methodologies that are relevant to clinical conditions, and the variability of study subjects including Asian glaucoma patients. Another limitation is that study quality was evaluated by the Jadad score for the RCT study and the modified Newcastle-Ottawa score for observational studies. The Jadad and Newcastle-Ottawa scores evaluate the criteria for sample selection, comparison, and intervention/exposure outcomes, where simplification of the quality assessment is at risk of variability in results between assessors (Arrison et al., 2017). Further studies need to be carried out by involving various databases so that it is hoped that publications related to the glaucoma population can be obtained to provide a comprehensive picture regarding the benefits of education in glaucoma patients in terms of clinical, cost, and quality of life of patients.

The results of the study indicate that patient education can improve glaucoma medication knowledge and adherence, but there is insufficient evidence to recommend specific interventions, and so cannot make substantial clinical recommendations. Educational interventions to increase knowledge and medication adherence of glaucoma patients should be tailored to the patient's characteristics and the local culture of the local community.

CONCLUSION

Knowledge education interventions are carried out through counseling, and training on the use of eye drops, group-based education by nurses, and counseling by ophthalmologists. All the interventions were successful in increasing patient knowledge with mixed results due to different methodologies.

Educational interventions to improve patient adherence are carried out through counseling, and call reminders, eye drop counseling, and training, electronic

monitoring with reminder alarms, telemedicine, educational and problem-solving programs, and health coaching. Educational interventions were successful in improving patient adherence to drug use, and adherence with eye care medical visits. Medication adherence monitored through a pharmacy database gives low adherence results because many data are not recorded in the pharmacy.

Patient knowledge of glaucoma disease can increase medication adherence, and medical visits, which are expected to maintain IOP values within normal limits, and maintain visual acuity of glaucoma patients. The majority of patients were satisfied with the eye care program that was followed.

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SUGAR SWEETENED BEVERAGE TAX AND ITS IMPLICATIONS FOR PUBLIC HEALTH

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ABSTRACT

Introduction: Sugar Sweetened Beverages (SSBs) consumption has increased to higher levels across all corners of the world. High sugar diets in the form of SSBs lead to increased calorie intake with almost no nutritive value when compared to solid food and contributes to the increased energy intake resulting in an unhealthy weight gain, often associated with health issues such as obesity, diabetes, cardio-vascular diseases, early tooth decay and formation of cavities. It is also observed that consumption of SSBs is linked to unhealthy habits like smoking, decreased physical activity, increased intake of fast food and increased screen time. **Method:** The required information on SSB tax implementation at the global level was retrieved from the literature reviews. **Result:** Taking such detrimental effects of SSBs into consideration, many countries are putting efforts to tackle the problem of higher consumption of SSBs by adopting measures such as taxations on SSBs. However, it is also extremely important to understand how these taxes help in generating higher revenues to the government which, in turn, can be used for various community needs in the respective countries. **Conclusion:** The same revenue can also be utilised for implementation of comprehensive healthcare programmes especially in Low and Middle-Income Countries (LMIC), by providing preventive, promotive, curative, rehabilitative and palliative services as a way to progress towards Universal Health Coverage (UHC).

Keywords: Berkeley tax, Non-Communicable Diseases, Sugary drinks, Sugar Sweetened Beverage Tax, Sugar tax

INTRODUCTION

Sugar Sweetened Beverages (SSBs) consumption has increased to higher levels across all corners of the world. SSBs are high in sugars in various forms such as fructose or sucrose. This high amount of sugar contributes to increased energy density and is an indication for overall reduced quality of a diet. Also, high sugar diets in the form of SSBs lead to increased calorie intake with almost no nutritive value when compared to solid food and contributes to the increased energy intake resulting to an unhealthy weight gain (World Health Organisation, 2017). Such unhealthy weight gain is often associated with health-related issues such as obesity, diabetes, cardio-vascular diseases, early tooth decay and formation of cavities and

also affecting kidneys and liver (Bombback et al., 2010; Malik et al., 2010b; 2010a; Bernabé et al., 2014; Malik and Hu, 2015). Such weight gain leading to obesity is considered to have a strong association with Non-communicable Diseases (NCDs) mainly diabetes mellitus, cardiovascular diseases, metabolic syndrome and also cancer. Additionally, regular consumption of SSBs also has a detrimental effect on the oral health, mainly contributing to dental caries (Malik et al., 2013).

Also, such a high level of consumption of SSBs has been linked to unhealthy habits like smoking, decreased physical activity, increased intake of fast food, decreased intake of fruits and vegetables and increased screen time (Park et al., 2012) All these factors eventually become risk factors in the development of

chronic diseases in the community.

With increasing prevalence of such diseases, individuals, families, communities and the nation have had to incur higher healthcare costs in the management of such diseases for a longer duration, which can have a huge impact on the economic development of a country (Allcott, Lockwood and Taubinsky, 2019). Hence to combat such events and taking the detrimental effects of SSBs into consideration, many countries are making efforts to tackle the problem of higher consumption of SSBs by adopting measures such as taxations on SSBs (Madsen, Krieger and Morales, 2019).

This implementation of SSB tax at the policy level is seen as an important strategy, based on the economic theory, which predicts lower demand for and consumption of SSBs with increase in prices of the SSBs (Cawley et al., 2019).

But, how effective are these taxes in reducing/changing the consumption behaviours of the people and is taxation the only way to prevent/reduce the consumption of SSBs across all corners of the world? This review discusses these areas and answers the questions in terms of global evolution of these taxes.

METHODS

The required information on SSB tax implementation at the global level was retrieved from the literature reviews. The literature search was conducted in PubMed databases (including MEDLINE). The medical subject headings (MeSH) keywords used were 'sugar sweetened beverage', 'sugary drink', 'sugar tax', 'food policy', 'non-communicable disease'.

The period of reference was from the year 2011 to 2021. Based on the references, studies which met the following criteria were included: (i) Studies on SSB tax (ii) Papers focusing on evidence-based approach to tackle NCDs. (iii) Studies published in English. Out of a total 178 articles, 23 were included for the final

report. Analysis of the literature was synthesised into a narrative review, which highlighted our key findings by the following themes: Sugar Sweetened Beverages, global scenario, benefits of such taxations.

RESULTS

Sugar Sweetened Beverages

Any liquid that has added sweetener most commonly in the form of sugar is called as SSB. The various forms of added sugar include but are not limited to brown sugar, sucrose, fructose, glucose, lactose, maltose, corn syrup, etc. All such drinks, either served hot or cold with added sugars, like soda, fruit-based juices, sports and energy drinks, coffee, tea etc., are defined under the SSB category (US Department of Health and Human Services, 2015).

World Health Organisation recommendations on sugar intake

The generated evidence from extensive research across the world has led to an understanding that increased sugar intake on a continuous basis is the leading factor in increased weight which, in turn, is directly leading to higher risk of obesity and also dental caries, with children being the most affected groups. Therefore, in an effort to combat such higher risks of childhood obesity from the intake of sugars, the World Health Organisation (WHO) has formulated guidelines on intake of free sugars. WHO recommendations for sugar intake is based on the quantity of intake of sugar. In order to have health benefits, the intake of sugars is recommended to be less than 5-10% of total calorie intake in both children and adult populations (World Health Organisation, 2017).

Rationale behind taxation on SSBs

Since 1975, there has been a continuous rise in prevalence of obesity around the world, with almost a threefold increase. More alarmingly, the estimated number of children and adolescents

suffering from obesity rose by nearly more than tenfold in the span of four decades (NCD Risk Factor Collaboration, 2017). Also, the number of adults who fall under overweight and obese categories is 39% and 13%, respectively (World Health Organisation, 2014). Obesity, which is the most strongly associated risk factor for diabetes, also is associated with cardiovascular problems and cancers. Also, in an observation between the development of obesity in SSB consumers when compared to that of SSB non-consumers, the latter had a 26% less risk of developing obesity (Malik et al., 2010a). Such higher levels of obesity leading to higher prevalence of diabetes have been causing a heavy economic burden to countries in the form of accelerated and increased healthcare costs for treatment and management of diabetes. Therefore, in order to prevent and reduce such impacts on the health of the individuals and on healthcare systems, taxation on SSBs is being seen as a feasible strategy that can be easily adopted at policy level globally. Also, the money raised from such taxes is being utilised for implementation of various social activities. Hence, taxations on SSBs is seen as a necessary measure to confront one of the most important modifiable risk-factor for obesity; diet. Taxation on SSBs can help lower sugar consumption in a way similar to how taxation on tobacco products was implemented to bring a significant reduction in tobacco usage (Madsen, Krieger and Morales, 2019).

Global Scenario

The global approach towards discouraging the usage of products that have potential detrimental effects on individuals and societies has been to impose taxes on such products. These taxes are popularly known as ‘Sin Taxes’. These were mainly imposed on tobacco products and alcohol products. However, with the unprecedented levels of rise in the global prevalence of obesity, diabetes and other

non-communicable diseases, one of the major causes in the form of sugary drinks have been identified and since then has been increasingly associated with sin taxes. This newer form of tax category is popularly known as ‘Sugar Tax’. This has been thought to have a potential effect on the consumption of SSBs, which have a major role in the chronic non-communicable diseases. Hence, based on the experiences from other countries and by adopting global recommendations, more than 50 countries along with smaller jurisdictions have adopted/formulated/implemented such taxations in their respective states in order to combat the increasing rise of non-communicable diseases, mainly obesity and diabetes (University of North Carolina, 2021).

Chile

Since 1960, an additional tax known as ‘Impuesto Adicional a las Bebidas Analcoholicas’ has been implemented in Chile as an additional tax on non-alcoholic products. This tax was in proportion to the estimated value of the respective product and was fixed at 13%. Although such taxation was in implementation for nearly four decades, there was no evidence suggestive of its impact on the consumption of sugary drinks. However, this tax structure went through major modification in the year 2014 by taking into consideration the amount of sugar added to the beverage rather than the previously existing fixed tax in proportion to the value of the product. The limit for the value for amount of sugar added to 100 mL of the drink was set at 6.25 grams. Therefore, effective from then, the tax on those drinks having added sugar of more than 6.25 grams has been increased to 18%. Whereas in those drinks having added sugar of less than 6.25 grams, the tax has been reduced to 10%. This has led to the creation of two categories of beverages with the threshold level of sugar added as the differentiation factor for the implementation of SSB tax.

Nakamura et al. (2018) have evaluated the impact of such a tax on SSB consumption at the household levels. They have utilised the household level data on grocery purchases and analysed it for seeing the trends in buying the sugar drinks pre and post to the implementation of sugar tax. They have reported that a downward trend was seen, especially in the people from higher socioeconomic strata, in the purchase of drinks which are high in sugars. They concluded that, although the changes in tax structure was effective, there is a definite need for evaluating the influence of such tax on the SSB consumption patterns among the individuals and also on their health behaviour (Nakamura et al., 2018).

France

In the year 2012, France became the first country to have introduced the taxation reforms on both natural and artificial sweeteners. This led to the implementation of a beverage tax of nearly 7-euro cents per every litre of sugary beverages irrespective of the category of sugar added or artificially sweetened. Following this, in 2018, the Government of France formulated a newer strategy in the form of banded taxation, effectively increasing the price of sugary drinks in a progressive manner to the maximum cap on tax of 20-euro cents per litre (Silva et al., 2013).

In a study which has utilised the household level scanner data to assess the impact of beverage tax on the overall sales of sugary drinks, only 2% reduction in the purchases of soft drinks was reported. Also, observed was that the sale of fruit juices had increased post the introduction of taxation reforms in the country. Also, only a 39% pass through rate was observed for sugary drinks while sodas had 100% pass-through rates (Berardi et al., 2016).

Mexico

The SSB taxation reforms were introduced in Mexico in 2014. An excise tax was introduced which imposed one

Mexican Peso for every litre of such drink at the production level, thereby increasing the cost of SSB at the consumer level by 10%. In a study conducted to assess the impact of taxation on the purchase of SSBs, it was observed that the total number of purchases of such beverages was reduced on an average by 7.6% in the following two years post the implementation. The effect was much higher at 11.7% reduction in the purchase among households with limited resources (Arantxa Colchero et al., 2015). Also, part of the total revenue of nearly 2.6 billion US\$ that was generated was utilised for various societal needs including the installation of water fountains in Mexican schools (Álvarez-Sánchez et al., 2018).

United States of America

The first ever taxation on SSBs in the United States of America (USA) came into action in 2014 in Berkeley, California, USA. It levied a general tax of one cent for every ounce of SSB and also on the sweetening agents. This tax has been exempted to products such as alcoholic drinks, milk-based products, 100% natural juices and drinks having medicinal properties (Falbe et al., 2015).

A study conducted in two large grocery chains in Berkeley has shown the declination in sale of SSBs sales by almost 9.6% post the implementation. Also, a 1.5 cents of excise duty tax per an ounce of SSB was levied in Philadelphia in 2017. In a study conducted to see the differences in price of SSBs from large chain retailers prior to taxation and post taxation, it was observed that the price of SSBs was raised by around 0.7-1.6 cents per ounce of SSB depending on the type of point of sale, such as supermarkets, mass merchandisers and pharmacies. The findings from this study showed a significant reduction in the overall sales of SSBs by 51% post the implementation (Roberto et al., 2019).

Barbados

The Government of Barbados

introduced its own adoption of SSB in the form of ‘ad valorem tax’ in 2015 based on the alarming findings of increased levels of obesity and diabetes, from a nationally representative survey. This added an additional 10% levy on the sugary beverages, making them more expensive by almost 6% when compared to the pre-tax prices (Howitt et al., 2015). A post-tax survey was conducted to observe the effect of ‘ad valorem tax’ on the sales of SSBs. An average decrease of nearly 5% in the weekly sales was observed, while the average weekly sales of non-sugary drinks saw an almost 5% increase. The major contributor to the total decrease in sales was found to be from the carbonated drinks (Alvarado et al., 2019).

United Kingdom

SSB taxation was imposed in the United Kingdom (UK) as the Soft Drinks Industry Levy (SDIL) starting from 2018. It is a tiered system in which tax is being levied both on the producers and importers of SSBs. This two-tier system is based on amount of sugars added in a drink, i.e. the higher the sugars are, the higher the levied tax. Based on two main categories of levels of added sugar in 100 ml (5-8 grams and more than 8 grams), an 18 pence for a litre of a drink and 24 pence for a litre of a drink was levied, respectively. However, it gives a tax exemption to 100% natural fruit juices, milk-based products and drinks which have added sugars of less than 5 grams in quantity per 100ml of a drink.

The targeted revenue of 500 million pounds expected to be generated via this system by 2020 will be used specifically for the purpose of promoting healthy behaviours in the schools through the development and implementation of programmes related to various sports and physical education training activities (Burki, 2016; Moore et al., 2019).

South Africa

In order to combat the increasing

prevalence of type-2 diabetes, South Africa instituted the first ever SSB tax in the year 2018. This tax was named as ‘Health Promotion Levy’ (HPL) and it was the first of its kind in the region of the sub-Saharan continent (Popkin and Hawkes, 2016). Similar to the multi-tiered tax regimen that was implemented in the United Kingdom, HPL also levies a fixed 2.1 cent for every gram of sugar content irrespective of its addition or not, making it costlier. That means the threshold level is based on the amount of the sugar content rather than the amount of sugar added. The threshold of sugar remains at 4gms/100 ml (Veerman, 2017). A before and after study conducted in South Africa post the implementation of HPL observed the differences in the individual attitudes and behaviours towards the consumption of SSBs. It was observed that the intake of taxed sugary beverages has decreased while the intake of untaxed beverages has increased. They have observed that HPL had an impact on the total amount of sugar in the beverages with almost 31% reduction in the sugar, with an additional 9% reduction due to reformulation. However, the reduction in sugar consumption due to differences in the behavioural patterns was less than 21% only (Essman et al., 2021).

Benefits of taxation on SSBs

Imposing taxes on SSBs is considered as one of the viable mechanisms to reduce the overall consumption of sugars. Available evidence is also of suggestive of the positive impact of SSB taxation on obesity and diabetes (World Health Organisation, 2017a).

The benefits of taxation on SSBs can be categorised mainly into four categories. (i) Taxation leading to higher prices of sugary drinks, impacting the consumption of SSBs which, in turn, can have a potential public health impact. (ii) Such taxation can also lead to generation of large revenues, which can be utilised for public health interventions at a mass scale. (iii) Having a taxation reform at the policy

level can be helpful in delivering a strong message to the citizens of a state and can serve as a constant reminder about the higher consumption of SSBs, which cannot be part of a healthy diet. (iv) This also can sensitise the manufacturers to restructure their business strategies and reformulate their products as per the health standards and guidelines, eventually giving them incentives in the long run for making healthier products (Backholer and Martin, 2017). For example, evidence suggests that, by increasing the prices of SSBs by 20%, there can be almost 20% reduction in their consumption (Powell et al., 2013). Additionally, such SSB taxes can also reduce the healthcare-related costs in terms of mitigating such costs by preventive measures such as levying taxes. That means a levied tax of one cent per ounce of a drink can save an estimated amount of nearly 17 billion US\$ in terms of related healthcare expenditures (Wang et al., 2012). It is estimated that by imposing even a minimum tax on SSBs, an approximate amount of 13 billion US\$ and 11.8 billion US\$ would be generated in USA and China, respectively. This money that is generated via SSB taxes can be used for promoting health among the communities by encouraging healthy eating behaviours, developing infrastructure related to sports and other physical activities, capacity building for effective implementation of various public health programmes, etc. (Chaloupka, 2011). Also, imposing taxes on SSBs can lead to reduced consumption in low income and younger age groups. For example, in Mexico after imposing such taxes, there was an increased reduction in consumption of SSBs by 11.8% among households with limited resources when compared to a reduction of 7.6% in other groups (Arantxa Colchero et al., 2015).

DISCUSSION

With the ever increasing prevalence of NCDs having a huge toll on the nation's health, SSBs have gained attention as the

major drivers of NCD epidemic (World Health Organisation, 2018). SSBs being high in energies while have almost no nutritive value to the consumers, has been the major identifying factor, which has led to the widespread attention among the scientific community and policy makers. Hence, SSB tax has been seen as one of the major reforms required at the policy level in many nations, in addressing the rising level of NCDs. Similar to the other taxes related to products such as tobacco and alcohol, associated with NCDs, SSB tax is seen as a strategy to bring a change in consumption patterns of the individuals, families and communities (Malik and Hu, 2015).

This adoption of SSB taxations has gained momentum and popularity among policy makers in the last decade, with over 50 countries adopting such policies at a larger scale and pace, with an anticipated effort to accelerate the fight against NCDs via awareness campaigns and policy reforms that affect the SSB consumption patterns of the public (University of North Carolina, 2021). Also, it has been thought that implementing such taxes on SSBs would not only bring in the changes in consumption behaviours of the people. This can be more fruitful in reducing the consumption practices, especially among the youth, as they are more affected by the increased prices when compared to adults (Malik et al., 2013).

However, the most important aspect of implementing policy reforms is to study the effect of such reforms along with comparing and contrasting the levels of consumption prior to and post the implementation of such reforms. Hence, to understand the effect of such taxation on overall SSB sales and consumption, various surveys and research were undertaken, in an effort to produce evidence associating the SSB tax with consumption patterns among the public.

Although, in the nascent stages and with certain limitations, the effect of SSB taxations on consumption of SSBs among the general population is impactfully

positive. However, research-based evidence on SSB taxations in LMIC is lacking. But, considering the higher level of marketing campaigns in such countries which aimed at tapping the huge business potential of such markets with large number of populations, the research needs of SSBs in LMIC has to be prioritised. The major reason behind lack of such data on SSBs in LMIC would have been probably due to a series of much more complex healthcare needs and related risk factors existing in such countries.

The data from Mexico's SSB tax estimated an approximately 10% decline rates in the sales of taxed beverages while plain water sales saw an increase by nearly 13. Households of low socioeconomic status reduced purchases of taxed beverages by 17% (Arantxa Cochero et al., 2017). Similar observations were also made in other countries where such tax reforms were introduced (Berardi et al., 2016; Essman et al., 2021). Although it's a very small reduction in the context of larger populations, this can be seen as an immediate striking affect. However, the possibility of individuals coming back to older consumption behaviours cannot be ruled out, considering the socioeconomic development leading to increased preferences towards comfort foods, including SSBs.

Also, it has been observed that the consumption patterns of the individuals are inclined towards non-taxed beverages post the implementation of taxations. Although, the non-taxed products are less in sugar content, considering the taxations according to the quantity of sugar, such an inclination might increase their affinity for such drinks, which possibly can have a negative effect on the behavioural changes, because there is a chance for them to still consume a greater number of less sugary drinks for a prolonged period of time, which, in turn, can be detrimental in nature, in the context of obesity and diabetes. Hence, the focus of such taxations could be on the entire spectrum of sugar-natured

drinks, rather than on any specific section. In addition to the sugar content, considering the sizes of the drinks would also be of prime importance. As these measures are being adopted to alter the consumption behaviours, it is necessary to keep in check other things such as small sized sugary drinks, which can become potential hindering factors in altering the consumer behaviours.

The pass-through rates of the taxes help us better in understanding the role of such taxes in health prevention. The pass-through rate indicates the amount of increase in the price of the product that has to borne by the individual consumers, rather than tax sharing across manufacturers, vendors and consumers (Silver et al., 2017). Therefore, the pass-through rate would have a direct impact on the cost of SSB in the form of increased maximum selling prices for consumers. Hence, higher pass-through rates of SSB tax would take the cost of the product to a higher level, thereby demanding increased prices from the consumers (Backholer and Martin, 2017). This has been thought to have a direct effect on the purchasing patterns of the consumers and has the potential of bringing down their higher consumption owing to the raised cost of SSB. Therefore, the higher the pass-through rates, the better the tax implementation and, henceforth, the better prevention (Madsen, Krieger and Morales, 2019). Hence, achieving high level of pass-through rates leads to increased penetration of such policy reforms into public. This would not only have a direct impact on the prices of SSBs, but also could act as a facilitating medium for increasing awareness among the public. However, more research in the longer timelines can accurately estimate the pass-through rates and assess their impact on the consumption based on the changes in a timely manner (Backholer and Martin, 2017).

CONCLUSION

The suggestive and conclusive

evidence on the impact of SSB tax on the consumption behaviours and consumption patterns of the people is still in the nascent stages. However, the existing evidence is highly optimistic and is suggestive of the positive impact of SSB taxes in terms of reduction in overall consumption of SSBs. However, while these findings might be optimistic, the other aspects of combating NCDs shouldn't be ignored, which otherwise can produce negative effects rather than outcomes of interest. Yet, it is also extremely important to understand how these taxes help in generating higher revenues to the government which, in turn, can be used for various healthcare needs of the respective nations.

The revenue generated through such taxes can be utilised in implementing comprehensive health care programmes especially in LMIC, by providing preventive, promotive, curative, rehabilitative and palliative services as a way to progress towards Universal Health Coverage (UHC). Such revenues can also be utilised for developing and building appropriate urban planning mechanisms that have an inbuilt space for facilitating non-sedentary lifestyles in the communities. That is, through such mechanisms, individuals, families and communities would become much closer to such places/facilities rather than traveling to far off places for maintaining regular physical activity.

In addition to this, taxation of SSB would definitely have an impact on the prevalence of obesity, which is a major risk factor for diabetes and other NCDs. By prevention of such huge burden of NCD, the money saved from the part of healthcare-related costs for managing such diseases can be utilised for providing equitable health services and developing health infrastructure. Hence, it is conclusive that the money that is generated either directly or indirectly by imposing SSB taxes can be used for various welfare measures of the population.

The important step in that direction

is by putting in place an effective taxation mechanism that can also be sustained in the long run along with other measures. Educating the people, especially the targeted groups (children and adolescents) on the harmful effects of SSBs in the context of NCDs is also equally important. This can be done via incorporating or formulating policies at the local level, which can prevent selling of all types of sugary drinks at places such as schools, institutions, sporting arenas/club houses and parks among many others. Preventing the sale of SSBs at local level, especially at the places used for physical activity or recreation, can send a strong message to the public at the right place and right time. Such a message might have the potential to alter the behaviours of the consumers, helping them progress towards their health goals. Also, research on SSBs has to be promoted in order to measure the benefits against the drawbacks on the sale of SSBs in the context of taxes and disease burden, respectively. However, creating a positive environment to bring in the behavioural changes to promote a healthy lifestyle among the people is the key to reduce the overall consumption of SSBs and to have a positive health outcome. SSB tax when combined with other preventive and promotive measures has the potential to be an effective tool in moving the populations towards the positive spectrum of health rather than looking at it as the only measure.

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