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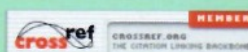
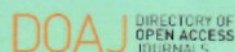
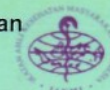
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Adherence to Taking ARV Drugs in Adolescents with HIV/AIDS

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Abstract

Adherence on taking ARV drugs in adolescents is the main issue in the success of ARV treatment. ARV treatment is related to improving the quality of life in adolescents infected with HIV. Aim: To summarize the factors improving adherence on HIV medication using ARV drugs in adolescents. Method: This article is a review of journal articles related to adherence on taking ARV drugs. Article reviewed were the articles on the past five years, 2015-2019, with a search strategy involving the articles from the following database including Science Direct, Scopus and ProQuest databases. Results: 12 articles related to adherence on ARV medication in adolescents. Conclusion: adherence is a significant aspect that must be maintained in order to overcome the impact of non-compliance on ARV medication as it can affect the quality of life of adolescents with HIV / AIDS.

Introduction

Human Immuno Deficiency Virus/ Acquired Immuno Deficiency Syndrome (HIV/AIDS) is a disease that attacks the human immune system and is transmitted through vertical and horizontal transmission (James, Nelson, & Ashwill, 2013). Based on data from the Joint United Nations Program on HIV and AIDS (UNAIDS) in 2018, the world population affected by HIV in 2017 amounted to 36.9 million people. 1.8 million of them are new infections (UNAIDS, UNAIDS Data 2018, 2018). Data from the Ministry of Health (2019), shows the cumulative number of HIV from 1987 to June 2019 was 349,882 and who had AIDS were 117,064 people. There are 10,730 children aged 15-19 years who are infected with HIV and 3799 people who have AIDS. The highest risk factors for HIV/AIDS transmission were heterosexual (70.2%), use of unsterile injection equipment (8.2%), homosexuality (7%) and perinatal transmission (2.9%) (Kementrian Kesehatan RI, 2019).

Living with HIV requires lifelong treatment with ART and is associated with frequent opportunistic infections, especially when optimal adherence to ART is not achieved (Kimera, et al., 2020). One of the measures to reduce the symptoms of infection that appears is to give ARV drugs (Kementrian Kesehatan RI, 2014) with the aim of reducing morbidity and mortality (Hornschuh, Dietrich, Tshabalala, & Laher, 2017). Indonesia has a target of ending the AIDS epidemic as a public health threat by 2030 (UNAIDS, 2018), with Indonesia's commitment to take a fast track approach 90-90-90 (Kementrian Kesehatan RI, 2019). In supporting the fast track approach, health behaviors are needed in undergoing ARV therapy, including adherence to treatment (Holtzman, Brady, & Yehia, 2015).

Adolescents are one of the age groups most affected by HIV. At this age there are changes both physically and psychologically so it is necessary to provide knowledge about the reproductive system, problems that occur

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in reproduction, the reproductive process and diseases that are transmitted through the reproductive tract such as HIV. (Shaluhayah, et al., 2017). There is a fact that adolescents born to be infected with HIV from their mothers, for one reason there are still health workers who do not provide good support to mothers to prevent HIV transmission from mother to baby, even though the support of health workers is very influential on maternal adherence to HIV treatment to prevent mother-to-child transmission of HIV (Isni, 2016). This must be a concern for health workers so that the circle of transmission can be broken.

Adherence to HIV treatment is a challenge, especially for adolescents, because the course of illness in adolescents occurs during the perinatal period and some adolescents do not know their HIV status (Hornschuh, et al., 2017). According to research (Denison, et al., 2015) stated that if until adolescence a child does not know his HIV status, it can cause non-compliance in taking ARVs because the teenager does not know the side effects of the non-compliance. According to the World Health Organization (WHO), an adolescent is someone aged 10-19 years old (Kementrian Kesehatan RI, 2018). Adolescents with HIV who are undergoing ARV therapy must be given good knowledge about HIV and ARVs in order to be obedient in undergoing therapy (Hornschuh, et al., 2017). The patient is said to be compliant if the ARV taken reaches 95% of the total drug given every month and can maintain its achievement (Kim, et al., 2014). Non-adherence to antiretroviral therapy (ART) continues to be the leading cause of treatment failure for people living with HIV (PLWHA) (Heestermans, et al., 2016), and increases the risk of drug resistance and spreading the virus to others (Ssewamala, et al., 2019), so it is very

important to know the factors that influence therapy adherence. Adherence to ARV therapy in adolescents is influenced by many things that support and hinder in achieving the level of adherence, so the authors are interested in conducting a literature study related to adherence to ARV treatment in adolescents.

Method

The search for articles was carried out on October 12 – October 20, 2019 by searching electronic data. Searches were made on the Science Direct, Scopus and ProQuest databases for articles in English using the keywords HIV/AIDS; Adolescent*, Antiretroviral. Articles with research on adolescents with HIV/AIDS undergoing ARV therapy, but only discussing ARV adherence will be studied. The deadline for publishing articles is determined for the last 5 years, namely 2015-2019. The inclusion criteria in this literature search were 1). Articles related to adolescents with HIV/AIDS undergoing ARV therapy, 2). Teenagers aged 9-19 years and their caregivers 3). Qualitative, quantitative or mixed method research articles 4). Fulltext and English articles published in 2015-2019. While the exclusion criteria in the literature search are 1). Adolescents with HIV who have other comorbidities are such as type of literature review articles or systematic reviews.

Based on the search results by entering keywords obtained from Science Direct as many as 1160 articles, Scopus as many as 9328 and Proquest 27,924 for a total of 38,322 articles. After being screened based on inclusion and exclusion criteria, 848 articles were obtained and after careful review, there were 12 articles that matched the researcher's goals. The literature search strategy is shown in the form of a chart in Figure 1.

Figure 1. Flowchart of the review of the article under study

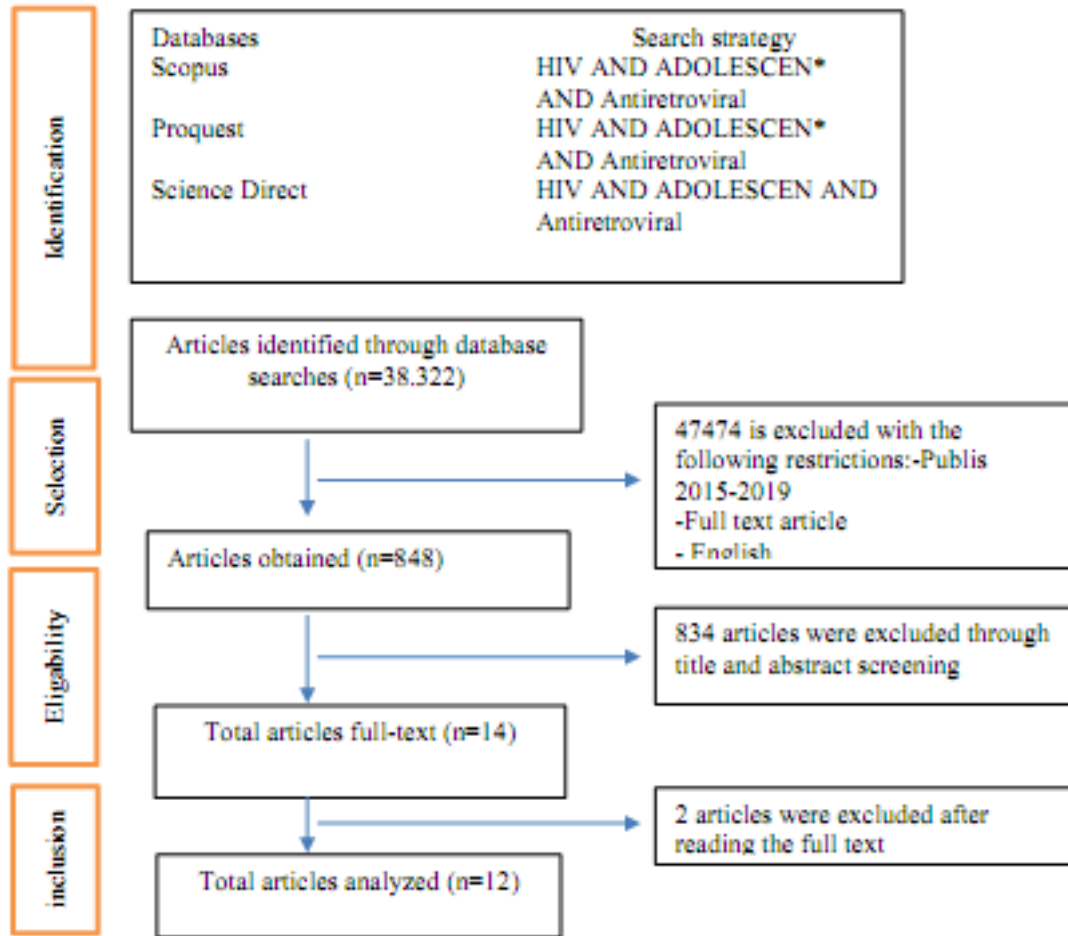


Table 1. Article Review Table

Author	Research purposes	Desain	Sample	Procedure	Result
Yi <i>et al.</i> , (2018) Kamboja	Describing the characteristics and levels of transition readiness and looking at them by gender differences in the adolescent population	Quantitative: cross-sectional	N: 328 teenagers	Interviews using questionnaires made by researchers and medical records	Most teenagers know their HIV status and ARV treatment but never reveal their HIV status to anyone
Xu <i>et al.</i> , (2017) Thailand	Exploring comprehensive factors influencing ARV adherence	Mix Metode Quantitative: cross-sectional Qualitative: Deep interview (IDI) in 12 participants (6 adolescents 6 nurses	N: 568 teenage couples and caregivers	Data collection with questionnaires, guided surveys with face-to-face and in-depth interviews	48.4% of adolescents proved to be non-adherent to ARV The themes obtained are knowledge and perception, adolescent experiences, interpersonal relationships, daily environment and skills to fulfill one's own needs
Montalto <i>et al.</i> , (2017) Kenya	Knowing the relationship of disclosure with treatment outcomes	Quantitative: retrospective cohort study	N:96 teenagers	Medical record data, standard Morisky Drug Compliance Scale questionnaire and objective assessment through pill counts and pharmacy refill records.	There was an increase in the percentage of ARV adherence and CD4 cell count in adolescents after disclosure status.
Denison <i>et al.</i> , (2015) Afrika	Exploring ARV treatment adherence from the perspective of the experiences of adolescents and their caregivers	Qualitative:In-depth Interview (IDI)	N : 32 teens, 23 caregivers	Deep interview (IDI).	The reasons adolescents and caregivers who do not comply with taking ARV do not comply are fear of unwanted disclosure, spiritual beliefs, adolescents do not know their HIV status, side effects of drugs. ARV adherence advocates: Family support, desire to live longer, healthier life, peer support and transition in HIV self-management.

Cluver <i>et al.</i> , (2015) South Africa	Knowing the experience of adolescents on the relevance of compliance with disclosure status	<i>Mix Methode</i> Quantitative: Cross-sectional Qualitative: <i>Grounded theory</i> : FGD	Kuantitatif: N 684 teenagers N: 64 (adolescents, caregivers, health workers)	Standard questionnaires and clinical notes from focused medical records Focus Group Discussion (FGD)	There is a relationship between knowing HIV status, travel time to the clinic and adherence The results of the FGD concluded that Disclosure strongly influences adherence in perinatally infected HIV-infected adolescents.
Kariuki <i>et al.</i> , al (2016). Kenya	Determining the determinants of ARV adherence in HIV-infected adolescents	Quantitative: Descriptive Survey Qualitative: In-depth interview (IDI)	Quantitative: N:187 teenagers Qualitative: N: 25 people (caregiver officer)	Interview using a questionnaire made by the researcher	Quantitative results: There is a relationship between adherence counseling before starting medication with ARV treatment adherence The themes obtained are adherence to drugs, the main challenges faced by adolescents in adherence, health knowledge.
Ashaba <i>et al.</i> , (2019) Uganda	understand the difficulties faced by youth with HIV and their impact on mental health	Qualitative: FGD and Indept interview	N = IDI: 10 youth, 30 Caregivers FGD (15 remaja, 25 pengasuh)	Focus Group Discussion (FGD) and in-depth interviews	There were 12 themes, namely: assumption of premature death, assault on perceptions, HIV stigma, internalized stigma, loss of parents due to HIV and AIDS, Poverty, counseling/counseling, family support, effective disclosure of HIV status, religious beliefs, symptoms of depression and non-compliance against ARV
Okawa <i>et al.</i> , (2018) Zambia	Exploring symptoms of depression and adherence to ART	<i>Mix Methode</i> Qualitative: Deep interview Quantitative: Survey	Qualitative N: 10 teenagers Quantitative: N: 190 teenagers	Data collection: In-depth interviews, CES-D questionnaire survey, Self-reported for three days.	The qualitative data identified challenges to ART adherence: drug management, physical reactions to drugs, and psychosocial stress. Factors associated with non-adherence to ARV's: loss of mother and lack of basic knowledge about HIV

Firdu <i>et al.</i> , (2017) Ethiopia	Knowing the predictors of ARV adherence among adolescents	Quantitative: a cross-sectional	N: 273 teenagers	Interviews using a structured questionnaire adopted the AIDS Clinical Trials Group (ACTG)	Most (79.1%) adolescents adhere to ARV treatment. There is a significant relationship between optimal ARV adherence with Cotrimoxazole Prophylactic Therapy (CPT) and adolescents with widowed parents. The themes obtained are beliefs that make people survive, the character of internalized survival skills, fun social behavior
Woollett, <i>et al</i> (2016) South Africa	Identify elements of resilience in a perinatally infected group of HIV-positive adolescents attending an HIV clinic	Qualitative In-depth interviews	N: 25 teenagers	In-depth interviews using a semi-structured interview guide	The results show that: adequate economy and distance to health clinics affect adolescent adherence to ARV regimens.
Bermudez <i>et al.</i> , (2016) Uganda	Examining whether the outcomes of ARV adherence among HIV adolescents in Uganda differ in relation to socioeconomic	Quantitative: <i>longitudinal randomized control trial</i>	N = 702 teenagers	Questionnaire with question guidelines developed by researchers.	
DeSilva <i>et al.</i> , (2018) China	Explore issues related to medication adherence, understanding of HIV, and disclosure of HIV status in adolescents	Qualitative study: Phenomenology In-depth interviews (IDI) and Focus Group Discussions (FGD)	N: 19 teen couple and caregiver	Interviews used a semi-structured interview guide. IDI with caregiver FGD with doctors and caregivers	The IDI and FGD analysis revealed themes including: disclosure as a process, fear of stigma, concerns about children's reactions on the part of caregivers and doctors, and inadequate readiness and skills of caregivers to make full disclosures. The importance of status disclosure (disclosure) in ARV treatment adherence
Galea <i>et al.</i> , (2018) Peru	Investigate barriers and facilitators to initiating adherence among Peruvian youth living with HIV.	Qualitative: Phenomenology Deep interview	N: 15 teenagers	In-depth individual interviews using a semi-structured interview guide	Emerging themes: Individual level barriers, Family/caregiver level barriers, Individual level facilitator Family / Caregiver Level Facilitator Other compliance facilitators such as Hospital staff support.

Results and Discussion

This literature study discusses 12 articles that have been selected to explore information about adolescent adherence to ARVs. Adolescence is a transitional period marked by the development of puberty, the formation of sexual identity and social and cognitive maturation (Mark, et al., 2017). Five studies describe that most of the average age of adolescents with HIV is in the age range of 10-14.4 years (Bermudez, et al., 2016; DeSilva, et al., 2018; Hudelson & Cluver, Lucie, 2015; Montalto, et al., 2017; Xu, et al., 2017). Five studies show that the majority of adolescent girls who are infected with HIV (Bermudez, et al., 2016; Firdu, Enquesselassie, & Jerene, 2017; Montalto, et al., 2017; Okawa, et al., 2018; Xu, Munir, Kanabkaew, & Le Coeur, 2017). HIV/AIDS in adolescents is mostly transmitted from the mother (Cluver, et al., 2015; Yi, et al., 2018). The average age of starting ARVs is in the 8-9 year age range (Firdu, Enquesselassie, & Jerene, 2017; Xu, et al., 2017). Three studies stated that adolescents had received ARVs for an average of 6-8.4 years (Firdu, Enquesselassie, & Jerene, 2017; Okawa, et al., 2018; Yi, et al., 2018). Three studies suggest that most adolescents are on first-line ARV regimens (Firdu, Enquesselassie, & Jerene, 2017; Xu, Munir, Kanabkaew, & Le Coeur, 2017; Yi, et al., 2018). According to a study in Cambodia 76.8% of adolescents experienced a decrease in viral load after antiretroviral therapy (Yi, et al., 2018). Adolescents who adhere to ARV treatment in Thailand are 51.6% (Xu, Munir, Kanabkaew, & Le Coeur, 2017). While research in Ethiopia, adolescent compliance is 79.1% (Firdu, Enquesselassie, & Jerene, 2017).

The problem with adolescents with HIV is knowledge about their own HIV status (Beima-Sofie, et al., 2017). Most adolescents (50.7%) never disclosed their HIV status to anyone (Yi, et al., 2018). The majority of caregivers 68.42% said disclosure requires attention to the stage of development and maturity. The unpreparedness of caregivers, lack of knowledge and skills to disclose the status of their children are obstacles in. Lack of disclosure, delay in disclosing treatment is a challenge for adolescents with HIV (Kariuki, Some, & Kimanthi, 2016). Adolescents have felt depressed due to the stigma of HIV on themselves and their families

(Okawa, et al., 2018). Stigma can occur in the home environment (Ashaba, et al., 2019), school environment and a place to play with peers (Kariuki, Some, & Kimanthi, 2016).

Stigmatization by caregivers and other family members occurs as in the separation of household appliances and similar items (Ramaiya, et al., 2016). In addition, children are treated unfairly and harshly, often being blamed if household chores are not done as expected. This treatment causes adolescents to feel unfairly loved by their parents/caregivers (Ashaba, et al., 2019). The HIV stigma attached to him makes a lot of worries (Xu, et al., 2017). Abusive treatment from peers and adults often causes negative emotions, including feelings of shame and emotional pain. To anticipate the social exclusion and embarrassment associated with their HIV/AIDS status, adolescents often isolate themselves so as not to be hurt by others (Ashaba, et al., 2019). Negative perception about HIV/AIDS is a chronic disease caused by unsafe sexual activity (Kariuki, Some, & Kimanthi, 2016) and people with HIV/AIDS will experience premature death and poor health (Ashaba, et al., 2019). This is in line with research which states that feelings of anxiety occur in people with HIV because there is a perception that people with HIV will die sooner. This is a source of stress and depression (Sosodoro, Ahmad, Prabandari, & Hakimi, 2017).

Discrimination causes adolescents with HIV/AIDS to believe that they are inferior to their peers and are shunned by their peers at school and the act of social exclusion causes feelings of shame and anger and even thoughts of suicide (Ashaba, et al., 2019). Research in Zambia states that there is a relationship between high scores of depressive symptoms and unsatisfactory relationships with families and health workers and adolescents of whom experience the stigma (Okawa, et al., 2018). Poverty is a challenge for adolescents with HIV where parents with HIV cannot work because of HIV / AIDS so that adolescents feel they are in poor conditions with basic needs that are not met, do not receive education and children are encouraged to work informally to fulfill their needs (Ashaba, et al., 2019). The financial pressure that occurs is a significant burden

in the lives of children with HIV. Insufficient household funds and long-term financial uncertainty negatively impact the ability to control and take ART, leading to barriers to medication adherence (Ramaiya, et al., 2016).

Good knowledge about HIV / AIDS and ARV treatment, including the consequences and resistance due to suboptimal adherence can encourage adolescents to adhere to ARV treatment (Xu, et al., 2017). Adolescent knowledge about HIV status can improve adherence (Cluver, et al., 2015). Adolescents must have the ability to disclose their HIV status to others and face discrimination and seek help in a timely manner (Xu, et al., 2017). Adolescents feel they have values and self-worth when they become leaders in peer support groups (Xu, et al., 2017). Transition is from childhood to adolescence (Kariuki, Some, & Kimanthi, 2016) and participation in worship helps youth with HIV improve their ability to cope with the challenges of living with HIV (Ashaba, et al., 2019). In addition, beliefs that make people survive, internalized character of survival abilities and pleasant social behavior support compliance (Woollett, et al., 2016). Religion and beliefs, whether places of worship, religious leaders or through prayer practices are another identified type of emotional support. (Lypen, et al., 2015). Based on research results (Vyas, et al., (2014), patients who maintain personal autonomy but always maintain their relationship with God in the sense of surrendering to God to overcome their illness will be more compliant with their treatment regimen

The process of disclosure to adolescents living with HIV is not fully understood (DeSilva, et al., 2018). Parents generally do not know how or when to disclose their status to their children (Nalugya, et al., 2018). Uncoordinated disclosure of HIV status during childhood is a major source of confusion and negative feelings about treatment (Xu, Met al., 2017). A small number of caregivers have informed their child's HIV status. The rest of the caregivers plan to disclose when the children are 14 years old or older. Caregivers are worried that if their child's HIV status is revealed, the child will be angry and hate himself and worry about the negative stigma that will be received

by the child and his family. (DeSilva, et al., 2018). Disclosure is very important to facilitate discussion between parents, youth and health workers about the disease and its treatment as well as facilitate access to peer support groups (Cluver, et al., 2015). The benefits of disclosure are that it makes it easier to find support, relieve the emotional burden of secrets, and educate their children about the dangers of HIV (Nalugya, et al., 2018). Several caregivers shared experiences with adolescents who were not told they were born with HIV, complicating efforts to emphasize the importance of adherence to ART (Maccarthy, et al., 2018), so that there is a significant relationship between HIV disclosure and adherence to ARVs and there is an increase in ARV compliance after disclosur. (Montalto, et al., 2017).

Basically, adherence to HIV treatment is almost the same as adherence to pulmonary TB treatment, namely, taking medication on time and not being interrupted. Drug taking supervisors to support medication adherence in patients with pulmonary TB is an important component (Fadila & Riono, Pandu, 2014), as well as in supporting ARV treatment adherence in HIV patients. Family support greatly influences ARV adherence in adolescents (Kariuki, Some, & Kimanthi, 2016) including emotional support and facility support related to taking medication. Emotional support and role models from caregivers can increase adolescents' expectations about the future and reduce self-hatred which ultimately supports medication adherence (Ashaba, et al., 2019). Adolescents who have parents or caregivers who are more economically secure have a higher chance of compliance (Bermudez, et al., 2016).

Providing continuous information in addition to strong support from health workers and parents or guardians can increase adherence among adolescents and become an intervention to reduce patient forgetting to take medication (Ankrah, et al., 2016). Patient satisfaction with health services and adherence to ARVs can be influenced by health facility factors and service provider factors (Leon, Koosed, Philibert, Raposo, & Benzaken, 2019). One of the health services provided is ARV counseling, before starting drugs and after starting ARV drugs

affects adherence to ARV (Kariuki, Some, & Kimanthi, 2016). Routine counseling and the duration of routine counseling are based on individual needs and are carried out face-to-face either individually or in groups (Mark, et al., 2017). Counseling services for those who experience stigma are very useful for adolescents in addition to receiving counseling services in the context of HIV care (Ashaba, et al., 2019). In addition, the role of health workers is very influential because officers often interact so that they have a better understanding of the physical and psychological conditions of patients with HIV (Isni, 2016). The peer group is the main source of psychosocial support. Peer group activities are often described by teenagers as fun, relaxing, and open-minded (Xu, et al, 2017), be an opportunity to make friends, encourage colleagues and help each other to remind each other to take medication and share experiences of being HIV sufferers and undergoing ARV therapy (Kariuki, Some, & Kimanthi, 2016). Counseling is needed to promote good adherence and to reduce the risk of HIV transmission (Ammon, Mason, S., & Corkery, J. M., 2018).

Side effects after taking ARVs such as feeling drunk, drowsy, insomnia, nausea, vomiting and stomach burning make adolescents lazy to take ARVs and lack of understanding of the indications for ARV treatment also contribute to barriers to adherence, such as missed doses of ARVs combined into a single dose (Galea, et al., 2018). In addition, adolescents with HIV/AIDS experience instability in the family, severe comorbidities, death of biological parents, changes in primary caregivers, substance abuse and domestic violence, family financial difficulties (Xu, et al., 2017) and conditions of emotional instability also occur in adolescents. This complicates parents' ability to ensure their child's medication adherence (Galea, et al., 2018). Spiritual beliefs such as belief in healing after being prayed for by religious leaders cause caregivers or parents to stop ARV treatment (Kariuki, Some, & Kimanthi, 2016), and extra-curricular activities or busy school schedules are the most common reasons teenagers and caregivers give for skipping ARV therapy. (Xu, et al., 2017). The results of the study in

Cambodia found that barriers to achieving ARV compliance include finding it difficult to remember taking medication (23.8%), adolescents will stop taking medication when they feel their health condition is getting worse (11.0%) (Chhim, et al., 2018).

Adolescents who have lost one or both parents cause them to lose someone who fulfills their needs (Ashaba, et al., 2019; Nalugya, Russell, Steven, Zalwango, Flavia, & Seeley, Janet, 2018). Study (Okawa, et al., 2018), states that adherence to ARVs is closely related to the loss of a mother; the absence of parents causes adolescents to change caregivers. Poor relationship or communication with caregivers can potentially lead to suboptimal compliance (Galea, et al., 2018), and the attitude of caregivers such as reminding when to take ARV drugs is done excessively (Xu, et al., 2017). Based on research (Kimera, et al., 2020) adolescents with one parent and adolescents living with caregivers also reported neglect, mistreatment, and abuse. Many situations in which they are treated as inferior to other children in the home are usually carried out by stepmothers who belittle and abuse them.

If the health services provided are slow, such as the old public insurance management (Galea, et al., 2018), longer travel time to clinic (Cluver, et al., 2015), difficulties in accessing medicines and health care including supply of medicines, unfriendly health care providers and lack of information about diseases can cause delays in ARV adherence (Kariuki, Some, & Kimanthi, 2016). In addition, individuals who missed doses of medication cited problems finding transportation money to get to health services as the main reason for not being able to maintain the regimen. They can't afford to travel to the clinic before their medicine supplies run out (Ssewamala, et al., 2019).

Adherence to ARV treatment is achieved if the ARV taken reaches 95% of the total drug given every month and can maintain its achievement (Elyanu, et al., 2015; Kim, Gerver, Fidler, & Ward, 2014). The two most common approaches to ensuring adherence in clinical settings are patient self-report and farm self-report and pharmacy-based metrics (Kabore, Muntner, Paul, Chamot, Eric, Zinski, Anne, Burkholder, Greer, & Mugavero, Michael J.,

2015). From the article, it was written that the average adherence of adolescents with HIV who received ARV therapy had different percentages such as in Thailand (51.6%) and in Ethiopia (79.1%). This figure is still far below the UNAIDS target of 90% compliance. (UNAIDS, 2017).

Seven articles that discuss the challenges that often occur in adolescents with HIV are disclosure status, where parents or caregivers feel this is something that is difficult to do because they are worried about the possible consequences. What is often feared due to the disclosure of HIV status in adolescents is that adolescents will be angry with caregivers and negative stigma from society towards adolescents and their families. Caregivers who were not biological parents experienced less difficulty in disclosing their HIV status than their biological parents. This is because biological parents are afraid of being blamed for transmitting HIV to their children (Medin, et al., 2015). In fact, disclosure has an important aspect of self-management, facilitating emotional, psychosocial and economic support from children, other family members and friends (Nalugya, et al., 2018).

Four articles mention that stigma and discrimination in adolescents with HIV are challenges in living their lives. Adolescents are a group of children who are vulnerable to stigma and discrimination. Adolescents living with HIV are less likely to disclose their HIV status to others outside the home, for fear of being stigmatized (Damulira, et al., 2019) . Stigma can come from the closest family such as friends and neighbors. Stigma from the family includes discrimination and neglect (Sugiharti, et al., 2019). Many individuals who experience stigma tend to avoid contact with other people resulting in an inability to form friendships and socialize with the surrounding community (Anima-Korang, Gere, & Salimi, 2018). Many youths state that it takes a great deal of courage to take medicine every day at school for fear of being identified as HIV positive and will be discriminated against (Kimera, et al., 2020). Stigma and discrimination can also lead to missed opportunities to change victims' behavior to prevent transmission to others, and access HIV-related services and young people

become more afraid of HIV-related stigma and discrimination than HIV disease itself (Gebremedhin, et al., 2017). The important thing that must be grown in adolescents with HIV in order to face stigma and discrimination is positive self-efficacy. The results showed that positive self-efficacy could mediate the effects of depression and stigma on ARV adherence (Umar, et al., 2019).

There are several factors that support ARV treatment adherence in adolescents, namely individuals, disclosure status (disclosure), family/caregivers, health care providers including peer groups. This shows how important the role and synergy between individuals, families/caregivers and health services and peer groups is. ARV programs need to involve youth and parents/caregivers in an association, especially involving psychosocial and community support so as to increase adolescent adherence to ARVs and encourage adolescents to adhere to control schedules, thereby increasing their access to sustainable ARV services (Graves, et al., 2018) . It is also better to disclose HIV status (disclosure) early on because delays in disclosing HIV status have a negative impact on overcoming disease and medication adherence (Medin, et al., 2015). In addition to the self-disclosure process, it is also important to disclose status to other families. Patients whose status is known by their families and who receive support from their families are four times better and have regular treatment compared to patients who do not receive support (Dahoklory, Romeo, & Takaeb, 2019).

Factors that hinder adolescents' adherence to ARV therapy are individuals, caregivers/families and health services. There is a difference between the factors that inhibit adherence in adolescents from their parents, namely that adolescents do not use money as an obstacle to carrying out ARV therapy (Hornschuh, et al., 2017). The lack of psychosocial support is said to be an obstacle in adolescent compliance, especially for those who are in boarding schools and manage ARV themselves (Gebremedhin, et al., 2017) even though support from family or people around is very decisive in increasing the confidence of patients with HIV AIDS to be able to live longer by obediently taking ARV drugs (Dahoklory, Romeo, & Takaeb, 2019).

Conclusion

Based on the results of a literature study from 12 articles, it was found that ARV treatment adherence in adolescents was influenced by supporting and inhibiting factors. The supporting factors that influence compliance are individuals, disclosure status, family/caregivers and health services. While the inhibiting factors that affect compliance are individuals, families/influencers and health care providers. Suggestion: it is important for nurses to identify the supporting and inhibiting factors that exist in adolescents with ARV treatment. This will make it easier for nurses to identify problems that exist in adolescents so that problems can be overcome together and do not become an obstacle in maintaining ARV treatment adherence.

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Understanding Perinatal Mortality Causes in Indramayu, Indonesia

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Abstract

Perinatal mortality is a useful indicator for assessing pregnancy and delivery care. Indramayu was the fourth-highest perinatal mortality in West Java province in 2015. The cause of death can be prevented from several factors including health workers, patients, referrals, and the availability of healthcare facilities. This study aimed to analyze the causes of perinatal mortality in Indramayu. The Study found 375 perinatal deaths but only 296 cases have documents according to the inclusion criteria. Statistical analysis showed there was an association between maternal disease and referral delays with preventable perinatal mortality ($p \leq 0.05$). Maternal disease in Indramayu cannot early be detected due to the lack of antenatal care services and behavioral factors on choosing a helper contributed to referral delays. It is necessary to improve the quality of antenatal care services by doing minimum standard of antenatal care for early detection of maternal disease and improving health promotion about danger sign of pregnancy and choosing birth attendants to reduce referral delays.

Introduction

Perinatal mortality is a useful indicator for assessing pregnancy and delivery care in a country, both in terms of the use of the services as well as the ability to ensure the birth of healthy babies (Bkkbn., BPS., & Kemenkes., 2012). Perinatal mortality is the number of stillbirth babies at 22 weeks' gestation to those who die within seven days of delivery (WHO, 2016b). World Health Organization (WHO) reports that 4.5 million infant deaths annually and 75% of infant deaths occur in the first week of life (early neonatal), and 25% -45% occur 24 hours after birth (WHO, 2016) Besides that, based on the report of the child watch organization "save the children fund" it is estimated that 1.3 million babies are stillborn each year. However, stillbirths have not become a serious concern because there is no target of reducing stillbirths on MDG's and SDG's (Wright S et al., 2014)

Perinatal mortality in the world ranges

from 10/1000 births in high-income countries and reach 50/1000 births in low-income countries (Ezechi & David, 2012). Based on the Demographic Health Survey Indonesia (SDKI) in 2012, perinatal mortality in Indonesia is 26/1000 births. While the perinatal mortality in West Java province based on that report is 24/1000 births (BKKBN et al., 2012). Based on a preliminary study conducted at 27 districts in West Java there were 2,563 cases of perinatal death in 2014 with 1,055 stillbirths and 1.508 early neonatal deaths. In Indramayu perinatal mortality in the year 2014 is 370 cases and increased to 375 cases by the year 2015. Perinatal mortality results in the psychosocial and economic burden for families and the State. Parents with stillbirth babies can experience a variety of psychological symptoms for a long time after the death of her baby. An estimated 4.2 million women live with depression associated with a history of the death of her

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baby (Frøen et al., 2016).

Globally, the cause of stillbirth baby is an infection that occurs in pregnant women, obstetric complications in the maternal, the maternal health disorders (hypertension, diabetes, obesity), and congenital abnormalities (Frøen et al., 2016). Early neonatal causes of death were sepsis, prematurity, asphyxia, and congenital abnormalities (Viswanath et al., 2015). Most of the causes of perinatal mortality is a preventable condition except some of the congenital which cannot be prevented (BKKBN et al., 2012). Causes of preventable perinatal mortality can be grouped into four factors i.e. health workers as the giver of the pregnancy and delivery care; patient factors (age, parity, birth spacing, disease in the mother and antenatal care visit history); referral factors such as referral delay and availability of health care facilities like the availability of tools and medicines (Merali et al., 2014).

The referral in obstetric and neonatal emergencies needs to get special attention. Two-thirds of perinatal deaths are related to referral delays (Bapat et al., 2012). Referral Implementation is influenced by many factors i.e. geographical location, distance from health care facilities, travel time, the region of residence, the costs, administrative and transportation facilities (Luti et al., 2012; Upadhyay, Rai, & Krishnan, 2013). These factors can cause the existence of three delays that are delay in deciding to get help, delay in reaching health service after taking a late decision, and delay in getting the service after arriving in health care facilities.

Indramayu is the lowland and coastal areas with 66.26% the road condition are good and 1.7% heavily damaged. Based on the preliminary study on Health Office of Indramayu Regency, 375 cases of perinatal mortality are still found in 2015 which makes Indramayu became the five biggest perinatal mortality contributors in the West Java province. The causes of perinatal death need to be identified because it is predicted to reduce two-thirds of newborn and stillbirth deaths with appropriate prevention strategies through improved health systems (Frøen et al., 2016; Merali et al., 2014). This study aimed to understanding the causes of perinatal mortality

in Indramayu District.

Method

An explanatory sequential mixed method was used, where the quantitative study in the first phase and followed by a qualitative study in the second phase. This method is carried out to gain a deep understanding of the causes of perinatal death. Quantitative is done to get the factors related to perinatal mortality and Qualitative is done to explore the problems that may happen behind Perinatal Mortality. Samples in the Quantitative study are mortality reports and verbal autopsy document that was available in Health Office of Indramayu Regency. There are 375 mortality reports and verbal autopsy documents of perinatal mortality from 1st January – 31st December 2015. Quantitative sampling is done by purposive sampling technique. The Autopsy documents that incomplete and do not write the chronological are excluded. Data Collected by the first author. Secondary data analysis is done on 296 perinatal verbal autopsies in 2015 that write chronological of perinatal death.

Qualitative data collection is done by In-depth interview and Focus Group Discussion. Samples on the qualitative study are perinatal death parents and health workers involved with perinatal death. Qualitative sampling is done by purposive sampling technique. The participants lived in the district with the highest and the lowest number of perinatal mortality cases in Indramayu District, based on the results of the mapping from quantitative data i.e. Juntinyuat District and Cantigi District. An in-depth interview was conducted by the first author on six perinatal parents and three Midwives that matches the Criteria. Focus Group Discussion (FGD) was conducted on three head of midwives in primary health care that has perinatal mortality cases and two staff of maternal and child health section of Indramayu Health Office. This FGD led by the head of the maternal and child health section of Indramayu Health Office.

Quantitative data analysis through the process of entering data from perinatal verbal autopsy is to checklist form, re-checking, and coding the data. After that, data were analyzed using the chi-square test or Fisher's exact

test to know the factors related to perinatal mortality. Qualitative data were analyzed using a content analysis method by founding themes (Creswell, 2013). The audio-recorded interviews were transcribed verbatim to the Indonesian language, read line-by-line to check the accuracy, and marked meaningful sentences to makes coding development. All collected coding was grouped into several categories and developed into themes. Last, the authors interpret the themes (Creswell, 2013).

In the process of collecting qualitative data, researchers positioning themselves as research instruments, and used interview guidelines which consist of 10 open-ended questions to get the data from an informant. authors used the triangulation method as a strategy for the validation of qualitative research data. The first author examined and cross-checked the results of perinatal family’s interviews with the results of health workers interviews and chronologically that were written on perinatal maternal audit documents. Then, the author does a debriefing with other authors

who are the mentor and expert to improve the accuracy of the results. This study has been approved by the Medical and Health Research Ethics Committee, the Faculty of Medicine of Padjadjaran University Bandung Number: 943/UN6.C1.3.2/KEPK/ PN/ 2016, and the study permission was obtained from Office of National Unity and Politics of Indramayu District and Indramayu’s Public Health Office.

Result and Discussion

Based on perinatal death report there are 375 cases of perinatal death in Indramayu District in 2015. However, from 375 cases only 310 cases have been documented in AMP form (OVP and or RMP/RMPP) and 14 of them are incomplete because it does not have a chronological death page. Therefore, known only 296 cases that can be included in the analysis. Frequency of causes of death, a period of death, place of death, a birth helper, and the number of case referrals can be seen in the following table:

Tabel 1. Distribution of Causes of Death, The Period of Death, Place of Death, Birth Helper and Referral Cases on Perinatal Mortality in the 2015 Year Indramayu District

Perinatal Death	n	%
The Cause of Death		
Not Be Prevented	34	11.5
Prevented	262	88.5
The Period of Death		
Stillbirth	148	50.0
Early Neonatal	148	50.0
Place of Death		
Non-Health Facilities	41	13.9
Health Facilities	255	86.1
Birth Helper		
Without A Helper	6	2.0
Traditional Birth Attendant	15	5.1
Midwife	133	44.3
Obstetricians	141	48.6
Case Citation		
Not A Referral cases	56	18.9
Referral cases	240	81.1

Based on table 1 knows that the majority of perinatal deaths in Indramayu can be prevented. The number of early neonatal death and stillbirth is almost the same. Most of the perinatal death happened in health facilities, there is labor not accompanied by health workers and some of them are referral

cases as well. Causes of perinatal death in Indramayu District in 2015 that came from preventable causes were deaths due to such as low birth weight, hypoxia/asphyxia, infection, and aspirations. Most of these causes are complications from premature birth. These results are similar to a study done by Viswanath

in southern India that showed 40% of whom perinatal mortality is babies born prematurely (Viswanath et al., 2015). Premature birth in Indramayu District when viewed from history on verbal autopsy is largely due to maternal complications. Furthermore, the causes of stillbirths, especially IUFD, are not revealed much because of the limitations of examination that can be done, but from the interview are strongly suspected due to complications and maternal disease during pregnancy.

The number of deaths in health facilities especially in the hospital because the hospital is the referral center advanced when patients are not able to be handled in the first level health facilities with various causes both in terms of the giver of the Ministry as well as the

availability of facilities such as the healthcare space, tools, and medicines. Although labor had been made at the health facility, perinatal death often is inevitable because the mother comes already late. This Result is similar to research in Mumbai, India (2012) where more deaths occurred in public health facilities because some were referral cases with delays (Bapat et al., 2012).

Table 2 shows the Relation of Perinatal mortality with the patient, health facilities, and referral factors in Indramayu District. Based on the table, there is no relation between mothers' age, parity, birth spacing, health facilities with perinatal mortality. Maternal disease factors and referral factors are related to perinatal death in Indramayu District ($p \leq 0.05$).

Table 2. Correlation between Patient Factors, Health Facility Factors, and Referral Factors with Preventable Perinatal Death in Indramayu District in 2015

	Perinatal Death				Total		<i>P value</i>
	Not Preventable		Preventable		n	%	
	N	%	n	%			
1. Patient Factors							
The age of mothers							
High risk (< and > 35tahun)	11	3,7	93	31,4	104	35,1	0,718*
Low risk (20-35)	23	7,8	169	57,1	192	64,9	
Parity							
High risk (> 4)	2	0,7	16	5,4	18	6,1	1,000**
Low risk (1-4)	32	10,8	246	83,1	278	93,9	
Birth Spacing							
High risk (< 2 years)	1	0,3	5	1,7	6	2,0	0,526**
Low risk (first pregnancies and spacing \geq 2 years)	25	8,5	194	65,5	219	74,0	
There Is No Data	8	2,7	63	21,3	71	24,0	
Maternal Disease							
With Maternal Disease	3	1,0	72	24,3	75	25,3	0,019 **
Without Maternal Disease	31	10,5	190	64,2	221	74,7	
Antenatal Visit History							
< 4 times visit	3	1,4	49	16,6	52	17,6	
\geq 4 times visit	25	8,4	134	45,3	159	53,7	0,066**
There Is No Data	6	2,0	79	26,7	85	28,7	
2. Factor In The Availability Of Health Facilities							
Available	34	11,5	259	87,5	293	99,0	1,000**
Not available	0	0	3	1,0	3	1,0	
3. Referral Factors							
Delay	13	5,4	189	78,8	202	84,2	0,000*
Not delay	15	6,3	23	9,6	38	15,8	

* Chi-square test, ** Fisher exact test

Perinatal deaths in Indramayu district occur mostly in mothers aged 20-35 years. That age is the reproductive period of a woman. A lot of women will get pregnant at this age;

therefore the opportunity of the complications in the mother which can cause poor fetal output resulting in perinatal death will be increased. The same results were obtained from studies

conducted in 4 countries (Guatemala, Pakistan, Zambia and the Republic of Congo) that nearly 75% of perinatal deaths occurred in mothers aged 20-35 years old (Engmann et al., 2014).

Preventable perinatal mortality mostly originates from mothers with parity 1-4. These results are similar to the results of a study in Mumbai, India which showed that maternal parity had no risk of increasing infant mortality (Bapat et al., 2012). Although other studies reported that perinatal mortality was five times greater in women with parity ≥ 4 (Viswanath et al., 2015). In this study 40.9% of mothers were primipara. Hashim reported that primiparous mothers had a risk of obstetric complications in labor such as the first and second stages of prolongation and the risk of delivering low birth weight babies which would increase perinatal morbidity (Hasim N, et al., 2012). Perinatal morbidity would result in death if not handled properly

Perinatal mortality in this study was more prevalent at birth spacing ≥ 2 years and first birth. The results of the study in Ethiopia showed that birth space ≥ 2 years will have a double risk of infant mortality by birth order ≥ 5 (Elhassan et al., 2010). Based on the data, there were 64 cases with long birth spacing (> 5 years) and the longest is 22 years. Conde-Agudelo reported in their study that birth spacing > 5 years was a significantly higher risk to have poor perinatal outcomes, such as prematurity and low birth weight. Mothers who become pregnant and delivery with over 5 years of birth spacing will be like mothers who deliver for the first time who have a risk of experiencing preeclampsia (Conde-Agudelo, et al., 2012). So, to prevent subsequent perinatal deaths should not only pay attention to mothers with birth spaces < 2 years but also need to be considered by mothers with birth spacing > 5 years. Birth spacing can be planned with family planning services.

Maternal diseases had a relation with perinatal mortality in Indramayu District. This study found that anemia, hypertension in pregnancy, preeclampsia/eclampsia, diabetes mellitus, cardiac disease, infectious diseases consisting of sexually transmitted infections, HIV, tuberculosis, and TORCH are the disease that was owned by maternal. This was stated by

the respondent in the following statement:

“Ya banyak mereka yang di bawah 11 Hb nya”

“Yes some of them (pregnant woman) have hemoglobin under 11 (mmHg)”(R1 FGD)

“Ibu yang bayinya meninggal itu terkena eklampsia”

“The mother whose baby died had eclampsia”(R1 FGD)

“Tekanan darah ibu nya 180 waktu di cek di rumah sakit, makanya bayinya meninggal”

“Mother blood pressure reaches 180 when checked in the hospital so the baby died”
(R5-In-depth family)

Maternal Disease resulted in poor fetal outcomes due to the mechanism of the disease that interferes with pregnancy and the fetus in the womb. In line with this Research, Viera et al. (2017), found that maternal disease history was the most significant determinant of perinatal mortality, mothers with infection disease have 8 times larger than mothers who don't have a disease record to have perinatal mortality. Another previous study found that anemia in pregnant women had caused low birth weight babies (Elhassan et al., 2010). Hypertension in pregnancy including preeclampsia is also reported increasing the risk of perinatal mortality because it increases the incidence of preterm birth, fetal growth disorders, and neonatal respiratory disorders (Ananth & Basso, 2011; Mustafa, et al., 2012). In addition, fetal death also increases five times greater in pregnant women with diabetes mellitus (Mathiesen, Ringholm, & Damm, 2011).

According to the respondent of health workers, this maternal disease is related to the factors of consumption of the mother during pregnancy. The food intake is less well-balanced nutrition and does not meet the nutritional needs of a pregnant woman. A consumption factor is less well due to confidence in the myth about the abstinence of eating on a pregnant woman resulting in not the share owned by the nutrition of pregnant women. This was stated by the respondent in the following statement:

“Ibu hamil nggak boleh makan telur, makan ikan. Waktu saya kasih tau biar makan telur, katanya suaminya belikan telur tapi terus

disembungkan sama neneknya. Jadi, gak dibolehin makan telur. Ya udah bayinya mati IUFD. Mereka bilang kalo ibu hamil makan telur nanti amis, dan kalau makan cumi-cumi nanti anaknya lahir kulitnya hitam”

“Pregnant woman should not be eating the egg, eating fish. when I give advice for eating the egg, her husband bought eggs but the eggs hidden by grandmother, so not allowed to eat eggs. So the baby ended up IUFD. They said If a pregnant woman eating egg it will be fishy and if eating squid, the son will be born with black skin”(R3-FGD)

Health workers also explained that some pregnant women only eat rice with crackers. Even though the husband works as a fisherman, all fish catches are sold or sometimes used as shrimp food in the pond. This is due to the economic factors of the family and also the trust factor about dietary restrictions. In abstinence, according to the information of health workers and the recognition of families of foods that are mainly challenged are food sources of protein such as eggs and seafood. People believe in myths, such as eating eggs, they will be fishy, if they eat shrimp, the baby will curl, if they eat squid, they will be born with blacks. Other problems were also conveyed related to consumption patterns, namely, pregnant women have been given free milk from the Public health center but did not want to drink milk for reasons of dislike and other reasons.

In the case of mothers with infections, 7 out of 11 of them have sexually transmitted infections. This is because of poor sexual behavior. Based on information from health workers in Indramayu there are 2 sub-districts with high cases of infection. In addition, the official health profile of Indramayu District was reported in 2015 that new cases of HIV were found in 279 women, and AIDS in 127 women in which 252 cases of HIV and 109 cases of AIDS were suffered by women aged 15-49 years old. This age is very possible for a woman to be pregnant. A previous Study reported that stillbirth increased 2 times higher and early neonatal increased 1,5 higher in mothers with HIV (Kennedy & Fawcus, 2014). McClure in their study say that it was difficult to determine the cause of fetal death due to

infection suffered by pregnant women due to several reasons such as not detecting infection at routine examinations and the difficulty of the autopsy on the placenta and dead fetus to find out the infection (McClure, Dudley, Reddy, & Goldenberg, 2010). The maternal disease should be known early in antenatal care. Curative and preventive action to prevent perinatal death can be done with optimal antenatal care.

Perinatal Mortality still a lot happening on the mother who has already done the ANC ≥ 4 times in Indramayu District, it can be caused by inadequate services when the ANC. Based on information from several health workers in Indramayu District, the standard of ANC examination has been implemented at the Public health center, but for integrated service post and independent practice services, they have not been implemented at all due to limited tools, time, and health workers. Merali stated that the health worker's services that are not following standards contribute to the causes of death that can be prevented (Merali et al., 2014).

The history of ANC is an attempt to maintain the mother during pregnancy. Perinatal mortality is a benchmark in assessing the success of ANC services. The results showed that most mothers who had preventable perinatal deaths had performed ANC ≥ 4 times so that there was no relationship between the history of ANC visits with preventable perinatal deaths. These results are not in line with the results of other studies that state that ANC visits can prevent infant deaths, especially early neonatal deaths (Merali et al., 2014). Another study also found that the utilization of at least one ANC visit during pregnancy reduces the risk of neonatal mortality (Tekelab et al., 2019). This study found there are still many deaths among mothers who have performed four times of ANC in Indramayu District due to inadequate service during ANC. This is known based on the description of the respondents below:

“...Dua belas kali periksa”

“twelve times check” (R2-Indepth family)

“.....di bu K di puskesmas, sebulan dua kali”..

“with Mrs.K in the public health service, twice a month” (R5-Indepth family)

Thus, perinatal death in mothers who do routine ANC indicates that the quality of ANC services is not yet good. Based on the results of interviews with health workers, it is known that in pregnant women who visit ANC at the Public health center, the minimum ANC service standard is "10T". However, for pregnant women who make ANC visits to the integrated service post, the services provided do not include 10 T. This is due to the unavailability of equipment to carry out checks at integrated service post so that for a complete examination must be done at the primary health care

"Kami sudah melaksanakan 10 T waktu ANC, kami juga kasih makanan tambahan (PMT) kaya susu. Ada petugas gizi misalnya ditemukan kasus KEK (Kurang Energi Kronis), kalo ada masalah kecil kami bilang segera dikonsultasikan. Petugas gizinya setiap hari standby di tempatnya".

"We have already given 10T in ANCs, we also gave PMTs as well as milk. There is a nutritionist, for example, a KEK (Chronic lack of Energy) case is found, if there is a problem we will immediately consult to nutritionist. The nutritionist are standby every day" (R1-FGD)

However, participants from mothers who had perinatal deaths revealed that they had not received 10T services. Examinations that will be obtained by the mother only measure weight, measure height, measure blood pressure and palpation examination on the stomach. This is known based on the description of the respondents below:

"Periksa periksa perut bae"

"Just check the stomach" (R5-Indepth family)

"Nggak pernah itu di tusuk tangan bu..."

"Never punctured the hand" (check HB) ..."
(R2-Indepth family)

To improve intranatal care services, the Indramayu District health office has a policy that every delivery that occurs at the primary health care service hours, delivery must be done there, not at the patient's home or in a private midwife. However, the application still depends

on the policies of each primary health care. Merali et al., (2014) stated that non-standard service provided by health workers contributed to preventable causes of death. In accordance with the antenatal care policy issued by the Ministry of Health, that pregnant women had at least 4 times contact with health workers, once in the first trimester of pregnancy, once in the second trimester and twice in the third trimester. If a minimum of ANC visits has been fulfilled but there are still many cases of perinatal deaths, it is necessary to evaluate the quality of services provided during ANC visits. Elvira et al., (2019) found that one of the barriers of implementation adequate ANC service were excessive workload of the midwives.

Perinatal deaths in Indramayu District in 2015 were mostly referral cases. Delay in referral is the main factor that causes perinatal death. This result similar to Bapat study which found that two-thirds of perinatal deaths were associated with late referrals (Bapat et al., 2012). A large number of reference cases describes that the referral system of neonatal in Indramayu District has walked. However, the references are done when the condition of the mother and fetus already emergency caused the death in health facilities cannot be avoided. This is expressed by healthcare personnel below:

"... kami merujuk banyak kasus. kalau ibu terdeteksi punya faktor risiko tinggi seperti persalinan prematur dan lain-lain, kami merujuknya ke rumah sakit. Jadi, ibu atau perinatal meninggal di rumah sakit"

"we refer many cases. If maternal detected with high-risk factors like premature labor and others, we refer them to the hospital. So, maternal or perinatal died in hospital". (R2-FGD)

The delay that occurs in the reference is divided into three: late for deciding to seek appropriate medical help for an obstetric emergency; (2) late for reaching an appropriate obstetric facility; and (3) late for receiving adequate care when a facility is reached. Decision-making is influenced by confidence in non-health workers. The problem that was revealed to be the cause of perinatal mortality was a factor in people's behavior in the selection of the first helper. Communities who prefer

helpers from non-health worker in overcoming problems in pregnant women, and they will call health workers when they cannot be helped by non-health workers. This stated by the respondent in the following statement:

“kalo manggil langsung tenaga kesehatan bisa diatasi”

“if directly calling health workers, it can be overcome” (R1-FGD)

The choice of non-health workers is due to family ignorance of emergencies in pregnancy and childbirth and trust in irrational matters. This is known based on the description of the respondents below:

“Awalnya dia (pasien) jam 8 seperti kejang, ditolong empat orang, yang nolong terlempar semua itu perutnya bunyi seperti air mendidih. Kata dukun yang nolong beliau tidak sanggup karena yang masuk badan dia ini bukan tandingannya. Trus saya minta tolong siapa saja datang kesini tolong menyembuhkan”.

“Firstly the patient convulsions at 8 pm, and then assisted by four people. The peoples who helped all thrown by her and her stomach sounded like boiling water. The shaman who helped her said that he could not help her because the body entered her was no match for him. Then I ask anyone who comes here to healing her” (R4-Indepth-family)

“... jadi dari keluarga percaya bahwa ada faktor mistik, jadi mereka memanggil Dukun, coba mereka memanggil bidan, saya yakin ibu dan bayinya selamat”

“... so the family believe that there is a mystical factors, so they call Dukun (non-formal midwife). If they call midwife, I believe the mother and baby will survive” (R1-FGD)

Perinatal deaths in Indramayu District were more than half due to the first delay. In this case, the first delay was mostly caused by pregnant women and families who did not know the danger signs in pregnancy and childbirth, besides the decision making, was too late because many families were invited to deliberations so that waiting often happened. This result is similar to Upadhyay et al. (2013) ,

research that first delay is caused by the inability of mothers to recognize danger signs and family beliefs that traditional medicine is more beneficial which results in delays in decision making (Upadhyay et al., 2013).

Perinatal death cases in Indramayu Regency are mostly caused by pregnant women and families not knowing the danger signs in pregnancy and childbirth, in addition to making decisions too late because many families are invited to deliberations so that waiting often occurs. This result is in line with the study of Upadhyay et al. (2013), first late is caused by the mother's inability to recognize danger signs and family belief that traditional treatment is more beneficial which results in late decision making.

Ignorance of the danger signs of pregnancy and childbirth is also due to a lack of information. Some respondents from the family claimed that during the pregnancy check-up, the health worker did not explain the danger signs, but he was told to read it himself in the Maternal and Child Health book. Health workers claimed not to explain the danger signs one by one because of the limited time and energy when doing services because of many patients. The first late is also caused by the family trust in irrational matters, so that when a danger signal is found, in this case, eclampsia, the family considers the seizure to be possessed or disturbed by unseen creatures so the family takes the patient to the shaman.

The second delay contributes the least to perinatal mortality in Indramayu District, which is as much as 6.4% of the total delay cases. Late for reaching health facilities occurs only at a little case of Indramayu District which is chronologically based on the OVP due to leaking car tire and traffic-jammed. In addition, road conditions have also influenced the delayed, because of not all the roads in the District of Indramayu in good condition. The transportation of reference used in Indramayu District is public transport, private transport, and ambulance village. There is no problem with the availability of transport. This is known based on the description of the respondents below:

“ Ya setengah jam dari rumah ibu ke rumah sakit, tapi ada jalan rusak jadi biasanya kita sampai i rumah sakit bisa satu jam”

Yes half an hour from mothers home to the hospital, but there is a damage roads so usually we reaching the hospital in one hour (R3-Indepth-Midwife)

“Oh untuk kendaraan kami nggak ada masalah karena sudah ada kerjasama dengan masyarakat”

“Oh, for the transportation we don't have any problem because there is an collaboration with the community.” (R3-FGD)

“Kami memakai transportasi umum, tapi nggak ada masalah”

“We used public transport, but there is no problem or any obstacles” (R3-In-depth Family)

The third delay is late for receiving adequate care when a facility is reached. The third delay occurred around one-fifth of the delay referrals that caused perinatal mortality in Indramayu District. The third delay was influenced by the referral system and the availability of resources. In Indramayu this happened because the doctors were not there. This is known based on the description of the respondents below:

“...kami cuma terus menunggu sampai malam sampai anak saya meninggal, perawat bilang nggak bisa berbuat apa-apa karena nggak ada dokter dan dokternya baru akan datang hari senin (2 hari kemudian)”

“... we Just waiting till the night, so my son died, the nurse says that they cannot do anything without doctors and the doctors will come on Monday (2 days left)” (R3-In-depth Family)

“ waktu kami datang tidak ada dokter dan bidannya bilang dokternya lagi ada operasi di tempat lain”

“... when we were coming there are no doctors, and the midwife said that the doctors still have an operating procedure in another place” (R6-Indepth Family)

Indramayu has a referral system known as SI-IRMA-AYU (Indramayu's maternal and

neonatal referral system). SI-IRMA-AYU is expected to prevent delay because it can facilitate two-way communication between hospitals and midwives so that there are no more refused patients after arriving at the hospital. The third delay in Indramayu District due to the availability of resources at the referral center. The results of this study are in line with research in the Indian village of Haryana which also found that among the factors that resulted in a third delay was the absence of doctors or other trained staffs and delays in the referral administration system (Upadhyay et al., 2013).

Several studies also found similar results that the three delays in referral are factors that are closely related to perinatal mortality. Salih and Eltyeb (2017), in their studies in Sudan found that the first delay is the highest in neonatal mortality compared to the second and third delay. The first delay was the highest delay in decision making and that was due to the inability of the mothers to recognize danger signs. Another study in Rwanda also found that delays for women in seeking obstetrical care are a critical factor associated with the main causes of neonatal death (Wilmot et al., 2017). From the discussion above, it is understood that referral delays have a strong relation to preventable perinatal mortality.

Conclusion

There was a significant relationship between maternal disease and referral delay with preventable perinatal mortality in Indramayu District. Maternal Diseases have not been detected early due to the lack of optimal antenatal care services. The referral delay factor was dominated by late decision-making in seeking help due to a lack of knowledge and information about danger signs in pregnancy and childbirth. The future researcher can investigate the quality of Antenatal care services to reduce the mortality rate.

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Is Prenatal Exercise with Prayer Movement Affecting Anxiety Level and Blood Pressure in Third Trimester?

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Abstract

Pregnancy is an important experience in a woman's life. However, these can cause anxiety. Midwives as a companion must be able to reduce it. In addition, the normality of blood pressure is also influential on the welfare of pregnant and fetuses. One way applied to decrease anxiety and normalize blood pressure is through prenatal exercises. This study aims to determine the prenatal exercise effectiveness with Muslim prayer movement on anxiety and blood pressure in the third trimester in the Independent Practice of Midwives in Karangroto Semarang. This type of research is Quasi-Experiment research with a non-equivalent control group design. Respondents numbered 40 people divided into intervention and control groups. This research took time at the Independent Midwife Practices in October–November 2019. The results showed an effect of the pregnancy exercise movement of prayer on the anxiety and blood pressure of third-trimester pregnant women ($p < 0.05$). This research concludes the effectiveness of prenatal exercise with Muslim prayer movement on anxiety level and blood pressure in the third trimester.

Introduction

Physical changes in pregnant women, like changes in body shape (with an increasingly large body), the pimples appearance, or peeling of facial skin. Psychological changes occurred due to anxiety before birth, changes in concentration in relationships with partners, and anxiety about financial problems. At the same time, she will also feel anxious at the birth of the baby and the beginning of a new phase in the life of the mother-to-be (Shohani et al., 2018).

In Quran, there are many verses related to the dynamics of the human psyche that theoretically can be used as a basis for psychotherapy to overcome anxiety. Al-Quran offers a solution for an anxious soul to find peace, both through reading and writing from the al-Qur'an text. Many verses of the Quran also contain guidance on how to deal with

life's problems without feeling anxious (Zaini, 2015). Anxiety is a psychological disorder that many people experience. In Arabic, it says when something is anxious, it will move in its place. So, the form of anxiety is a change that is contrary to what Allah describes in His Word (Zaini, 2015).

The anxiety experienced by pregnant women is caused by an increase in the progesterone hormone. In addition to making pregnant women feel anxious, this increase in hormones also causes emotional disturbances and makes pregnant women tired quickly. The hormone that increases during pregnancy is the adrenaline hormone. The adrenaline hormone can cause dysregulation of the body's biochemistry. It results in physical tension in pregnant women, such as irritability, anxiety, inability to concentrate, doubt, and maybe even wanting to escape the realities of life (Kheirkhah

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et al., 2014, (Schetter and Tanner, 2015). Pregnant women will experience psychological changes. Namely emotional changes, tendency to be lazy, sensitive, easily jealous, ask for more attention, feel uncomfortable, depression, stress, and anxiety. Anxiety in pregnant women can be due to the long period of waiting for birth, full of uncertainty, and also images of scary things during the delivery process. This fear is often felt in the first pregnancy or primigravidas, especially in the face of childbirth. The psychological burden on a pregnant woman is more common in the third trimester of pregnancy than in the first and second trimesters (Astuti and Hadisaputro, 2019). In a state of heavy psychological burden experienced by pregnant women, it can often affect the life of the intrauterine fetus and the abnormalities that arise depending on the time of occurrence of the psychological burden. If the disturbance begins to appear in early pregnancy, it can affect intra-uterine fetal growth, causing stunted fetal growth or Intra Uterine Growth Restriction (IUGR), to disruption of the fetal heart rate when the pregnancy is close to giving birth (Ibanez et al., 2015).

The existence of anxiety, also related to the condition of blood pressure. High anxiety is closely related to hypertension. Hypertension in pregnancy ranks second after bleeding, as the biggest contributor to MMR (Maternal Mortality Rate) in Indonesia. However, there was a change in the proportion until 2013. Where bleeding and infection decreased, while hypertension in pregnancy had increased. More than 25% of the causes of AKI in 2013 were hypertension in pregnancy (Ministry of Health, 2013). Hypertension in pregnancy, including pregnancy complications more than 10% worldwide. Hypertension is one of the leading causes of maternal and child morbidity and mortality worldwide. 1 in 10 of all deaths in Asian and African states are associated with hypertension in pregnancy. One-fourth of maternal mortality in Latin American states is related to complications from hypertension in pregnancy (Zaini, 2015, Schetter and Tanner, 2015, (Loomba et al., 2012).

One of the non-pharmacological treatments for anxiety and hypertension is physical exercise. One of the physical exercises that

are safe for pregnant women to do, according to The American College of Obstetrics and Gynecologists is modified pregnancy exercise for pregnant women (American College Obstetricians and Gynecologists (American College Obstetricians and Gynecologists, 2013). Low-intensity workouts such as pregnancy exercise provide beneficial physiological effects for pregnant women. Pregnancy exercise has positive effects on reducing depression in pregnant women. Pregnant exercise during pregnancy can significantly improve lower pain, feelings of discomfort and stress, and can improve the quality of life (Astuti and Hadisaputro, 2019, Berghella and Saccone, 2017).

Exercises recommended for pregnant women help maintain the body health and the fetus to develop properly and keep the mother's emotions stable are walking, cycling, swimming, pregnancy exercise, hypnobirthing, and yoga (Hinman et al., 2015). Prenatal exercise is a therapy in the form of activities or movements given to pregnant women to prepare themselves, both physical and psychological, to keep the mother and baby healthy. For primigravida and multigravida pregnant women, it is highly recommended to follow a pregnancy exercise program for the health of the mother and fetus (Curtis, Weinrib and Katz, 2012; Shohani et al., 2018).

Pregnancy exercise helps the mother to connect with the baby and her own body through deep practice and build awareness during the birth or delivery process. Physiologically, this yoga exercise will reverse the effects of the stress involving the parasympathetic part of the central nervous system. Pregnancy exercise will inhibit the increase in sympathetic nerves so that the hormone that causes body dysregulation can decrease. The parasympathetic nervous system has the opposite function of the sympathetic nerve. It will slow down or weaken the internal organs' work of the body. As a result, there is a decrease in heart rate, breathing rhythm, blood pressure, muscle tension, metabolic rate, and the production of stress-causing hormones. As the levels of stress-causing hormones decrease, the whole body begins to function at a healthier level with more energy for healing, restoration, and rejuvenation. Thus, pregnant

women will feel relaxed along with decreased anxiety symptoms (Curtis, Weinrib and Katz, 2012; Astuti and Hadisaputro, 2019). Based on the research results on the effectiveness of pregnancy exercise in reducing the anxiety of pregnant women in the third trimester, there is an anxiety reduction on the first day and the third day before and after being given pregnancy exercise.

Prayer is an obligation for every Muslim who has fulfilled the mandatory requirements to perform prayer. . Many benefits are obtained in every prayer movement when viewed from the health aspect of prayer, which can have a therapeutic effect on humans. By performing the prayer movements perfectly and correctly, the body organs will be healthy because they have a calming effect on the soul or relaxation, so blood circulation becomes smooth, and the muscles in the body relax. Pregnant women feel it with their beloved children because they can have a therapeutic effect when done properly, solemnly, and intend to worship and get closer to Allah SWT. Drastic changes in pregnant women often cause discomfort and even become a problem. These problems can be physical or psychological disorders. One of the alternatives to prevent this disorder is to do special exercises for pregnant women to prepare the mother for childbirth, reduce light stress during the Christmas season (Schetter and Tanner, 2015).

One of the complementary therapies introduced to control hypertension is prayer movement therapy. Movement in prayer therapy will activate various joints in the body. In addition, it produces a better effect than classical music therapy sessions. Because basically, the majority of the Muslim population is more comfortable with prayer movement interventions than listening to classical music they rarely do. The prayer movement is a complex activity, consists of mental, verbal, and physical activity. When these elements unity, even though the energy used in prayer is not optimal, the results and benefits generated can be higher than the other activity. Therefore the implementation of prayers must be carried out with all your heart and mind, verbally say prayers solemnly as the body carries out the movements in prayer (Doufesh et al.,

2014). Several studies have stated that the prayer movements include standing, bowing, prostration, and sitting, are the same as exercise or gymnastics with a therapeutic effect and can improve blood circulation to the fetus, especially prayer movements performed five times a day. Therefore prayer movements can make pregnant women healthy and fit and not expensive to pay for professional instructor services.

Method

This research is a Quasi Experiment with a non-equivalent control group design. The subjects of this study were all 3-trimester pregnant women at the Karangroto Region Midwife Independent Practice, totaling 40 respondents who had adjusted to the inclusion and exclusion criteria, were willing to take part in the study by signing the consent form after explanation. With the inclusion criteria: pregnant women in the third trimester did not experience any problems or complications, the pregnancy was wanted and/or planned, and the exclusion criteria for mothers were blind and/or deaf. The research subjects were divided into two, namely, the intervention group and the control group. In the intervention group, the intervention given was in the form of pregnancy exercise care, prayer movements, while the control group received conventional pregnancy exercise care.

To measure the anxiety is by the Zung Self-Rating Anxiety Scale and measuring blood pressure using a blood pressure check (sphygmomanometer). The statistical test used in this study used a frequency distribution and chi-square test or Fisher exact test. If the p-value <0.05 , then H_0 is rejected or H_1 is accepted. While if the p-value is > 0.05 , then H_0 is accepted or H_1 is rejected. This study seeks to uphold scientific and ethical attitudes in research. Researchers try to minimize losses that may arise and maximize research. This research took place on the Midwives Independent Practice in the Karangroto area and took time in October-November 2019.

Results and Discussion

The distribution of characteristics of pregnant women by age, education and

occupation can be seen in the following table:

Table 1. Characteristics of Pregnant Women Based on Age, Education and Occupation

No	Characteristics	Groups		p-value
		Intervention (n=20)	Control (n=20)	
1	Age (year)			0,916*
	<20	4 (20%)	3 (15%)	
	20-35	15 (75%)	16 (80%)	
	>35	1 (5%)	1 (5%)	
2	Education			0,736*
	High School (Junior or Senior)	13 (65%)	14 (70%)	
	Graduate (College or University)	7 (35%)	6 (30%)	
3	Profession			0,913*
	Housewife	5 (25%)	5 (25%)	
	Employee	7 (35%)	6 (30%)	
	Entrepreneur	5 (25%)	6 (30%)	
	Medic / paramedic	1 (5%)	1 (5%)	
	Government employee / Army / Police	2 (10%)	1 (5%)	
	Lecturer / Teacher	0 (0%)	1 (5%)	

*Mann Whitney Test

Source : Primari Data, 2019

Based on table 1, the results show that the analysis of the difference-test for the characteristics of age, education, and occupation in the two research groups did not show any significant differences ($p > 0.05$) so

the data was worthy of comparison.

The results of the analysis of the blood pressure difference-test before intervention can be seen in the following table:

Table 2. Results of Blood Pressure and Anxiety Measurements Before Intervention

Variables	Before				p*	After				p*
	Control		Intervention			Control		Intervention		
	n	%	n	%		n	%	n	%	
Blood Pressure					0,697*					0,038**
Low Blood Pressure	5	25%	3	15%		0	0%	0	0%	
Normal	8	40%	10	50%		11	55%	17	85%	
High Blood Pressure	7	35%	7	35%		9	45%	3	15%	
Anxiety					0,465*					0,007**
Moderate	16	80%	15	75%		14	70%	5	25%	
Mild	3	15%	5	25%		5	25%	7	35%	
None	1	5%	0	0%		1	5%	8	40%	

*Mann Whitney Test

**Two proportions test (one tail)

Source : Primari Data, 2019

Based on table 2, the results show that the analysis of blood pressure difference tests before the intervention in the two study groups did not show any significant difference ($p > 0.05$), so the data was declared homogeneous. The results show that the analysis of the anxiety difference test before intervention in two research groups did not show any significant

difference ($p > 0.05$), so the data was declared homogeneous. Based on table 2, the statistical test results also show that there is an effect of prayer movement on blood pressure ($p < 0.05$). And the statistical test results show that there is an effect of prayer movement on pregnant women's anxiety ($p < 0.05$). The characteristics of the research subjects used in this study

include age, education, and occupation.

Table 1 presents the characteristics of the research subject. Overall, the respondents' characteristics studied were not significantly different. So the two groups were considered homogeneous. Then, able to be compared. Based on the maternal age of the 40 respondents aged 20-35 years, 15 were pregnant women in the intervention group, 16 were pregnant women in the control group, which indicates that more than half of the respondents from each group were at the age of 20. -35 years old. It shows the reality of the population pyramid of Indonesia, with the majority of the population at a young age with a high pregnancy rate. Age <20 years is seven respondents consisted of four in the intervention group and three in the control group, and aged > 35 years two respondents consisted of one person in the intervention group and one person in the control group. Age is an indicator of personal maturation, organic, psychological, and intellectual functions that vary during the life cycle of human development. In the context of health behavior, chronological age and a person's ability to manage oneself in an environment involves various understandings, exemplary, and assessment. So it is hoped that with the increasing age, the environmental assessment will be more mature.

Based on education, of the 40 respondents, 13 were pregnant women in the intervention group when 14 were pregnant women in the control group who underwent final education in secondary school, and 13 pregnant women with high education, divided into seven in the intervention group and six in the control group. The higher the level of education and skills of Indonesian women, the more their knowledge will increase and open employment opportunities for women in various fields. The education level is also affected by the self-motivation factor. Someone who desires to learn and knows the benefits of education will immediately have self-motivation to improve education. Education for everyone has different meanings. Education is generally useful in changing thought, behavior, and decision-making patterns. A sufficient level of education will make it easier to identify stressors within themselves and from outside themselves. The education level also affects awareness and

understanding of the stimulus. One's education level is influential in responding to something that comes both from within and outside. People with higher education will give a more rational response than those with less education or are uneducated. It is per the opinion stating that the level of education also determines whether or not a person absorbs or accepts and uses his knowledge.

Based on the job, 40 respondents worked as laborers/employees, seven of them were in the intervention group, and six were in the control group. In addition, five people worked as entrepreneurs in the intervention group and 6 people in the control group. The results showed that pregnant women with high economic levels have stable emotions. A higher level of the economy can make it easier to obtain more information about health and disease. Increased anxiety is associated with less information obtained by mothers, so a higher economic level can reduce anxiety and make mothers more comfortable. A person's job is closely related to his economic levels. The more mothers have a good job, the better their economic level will be.

Blood pressure is the pressure exerted on the artery walls. The peak pressure occurs when the ventricles contract and is called systolic pressure. Diastolic pressure is the lowest pressure when the ventricles rest and fill their space. Each person's blood pressure varies widely. Infants and children usually have lower blood pressure than adults. Blood pressure is also affected by physical activity, where blood pressure will be higher when a person is doing an activity and lower when he is resting. To identify the causes of differences in the results obtained by previous researchers stating that the decrease or increase in diastolic blood pressure was affected by the length of time resting before taking blood pressure measurements after exercise, the magnitude of the increase in maximum oxygen use, and the length (in weeks) of exercise performed. In connection with this, an increase in diastolic blood pressure in this study was probably due to the short study time that took three weeks while the previous was four weeks. So it takes a longer time (Lomba et al., 2012; Triastuti and Dewi, 2018).

In table 2, the results show that three pregnant women in the intervention group experienced hypotension, seven with hypertension and ten had normal blood pressure. While in the control group, five respondents had hypotension, seven with hypertension and, eight had normal blood pressure. Pregnancy is a condition that is prone to all kinds of “stress”, which results in changes in physiological and metabolic functions. Pregnancy is a physiological event that causes a stress response. Healthy levels of stress (eustress) and hormonal effects are generally beneficial for both mother and baby at delivery. However, anxiety and excessive stress (distress) will cause a hormonal imbalance. Anxiety in pregnancy can cause a stress response, catecholamine increase, and cortisol hormones. They lead to increased respiratory rate, heart rate, reduced energy, and fatigue. Stress increases the secretion of the hormone cortisol in the human body in response to various stress (Thoma et al., 2013). In table 2 in the intervention group, 15 respondents experienced moderate anxiety. Five had mild anxiety. There were no pregnant women who did not feel anxious. Meanwhile, in the control group, 16 pregnant women experienced moderate anxiety, three people with mild anxiety, and only one who did not feel anxious.

Prayer is an obligation for every Muslim who has fulfilled the mandatory requirements to perform prayer. Many benefits are obtained in every prayer movement when viewed from the health aspect of prayer, which can have a therapeutic effect on humans. By performing the prayer movements perfectly and correctly, the body organs will be healthy because the prayer movements have a calming effect on the soul or relaxation. So that blood circulation becomes smooth, and the muscles in the body relax. Pregnant women and their beloved children can also feel benefits. Because prayer movements can have a therapeutic effect if they are done correctly, solemnly, and intend to worship and get closer to Allah SWT.

Drastic changes in pregnant women often cause discomfort and can become a problem. These problems can be physical or psychological disorders. One of the alternatives to prevent this disorder is to do special exercises

for pregnant women to prepare the mother for childbirth, reduce light stress during the Christmas season. Several studies have stated that the prayer movements include standing, bowing, prostration and sitting, are the same as exercise or gymnastics. They have a therapeutic effect and can improve blood circulation to the fetus, especially prayer movements performed five times a day. Therefore prayer movements can make women pregnant healthy, fit, and not expensive to pay for professional instructor services. Some of the discomforts often experienced by pregnant women in their third trimester include enlargement of the stomach and uterus, upper left abdominal pain (heartburn), constipation, lower abdominal pain due to fetal pressure, low back pain, swollen legs, etc. In the third trimester, the fetus' growth accelerates, so the organs around the stomach become stressed by the uterus and fetus. Meanwhile, the ever-increasing size of the uterus can also affect the position of the fetus that is not quite right, making it difficult for the mother to sleep and quickly experiences fatigue due to carrying the weight of the fetus she is carrying.

The prayer movement is one part of the implementation of the ergonomic exercise. It is a method applied to activate body parts to function optimally and stimulate hormones in the body, such as endorphins or others. When the endorphin hormone is released, it will provide a positive response, especially to fight the effects of the aging process experienced by the elderly. In practice, the prayer movement is carried out in a slow rhythm. It is per the age of the elderly (Habibi and Hasbi, 2015). The prayer movement intervention used in this study is part of non-pharmacological therapy in nursing practice. The use of complementary therapies is to optimize the pharmacological treatments given to patients, in this case, the elderly. In the elderly, the administration of pharmacological treatment is kept to a minimum. It is because the ability of the kidneys and other organs in the elderly has decreased, so they can't properly digest and absorb each drug given. The inability of the body organs to absorb the medicine consumed will cause the accumulation of some substances in the kidneys (Habibi and Hasbi, 2015).

Takbiratul Ihram with your hands together has tremendous benefits, especially for pregnant women and their fetuses. When Takbiratul Ihram utters the sentence of tauhid “Allahu akbar”. The Takbir speech can provide good stimulation for the fetus because it includes positive words that are repeated and full of educational values. Babies can stimulate from outside. His ability to receive these stimuli has existed since he was still in the womb. Many research proves that the fetus can hear voices both intrauterine and extrauterine. The increase in fetal heart rate when the mother speaks is the evidence it can recognize or respond to its mother. When lifting both hands during Takbiratul Ihram, the shoulder muscles stretch so that the blood flow, rich in oxygen, becomes smooth. The smoother the blood that contains oxygen, the better the effect on the fetus. Pregnant women likely experience emotional instability like anxiety, fear, worry, and happiness. If the negative emotions cannot be handled properly, it is feared that it will lead to depression during pregnancy. After Takbiratul Ihram, pregnant women

are encouraged to recite prayers. This prayer can create a sense of optimism by hoping for goodness from Allah SWT and leaving it to the creator. When raising both hands for Takbiratul Ihram, then the hands together, the muscles in both elbows feel a relaxing effect. With this effect, the blood becomes smooth with the lymph nodes. Therefore, a relaxed body and a resigned mind will help foster a high sense of optimism (Doufesh et al., 2014).

When pregnant, usually, the part of the body that often feels sore is the back of the body. This condition is called sciatica. This stiff feeling occurs in the lower back to the buttocks and down again to the hips until the legs, on 5-6 months of gestation. Sciatica occurs due to enlargement of the uterus so that the nerves in the hip area experience a little pressure. According to Imam Musbikin, who quoted Saboe’s statement, standing up straight before starting the Takbiratul Ihram is a very influential position on health. When standing, all nerves are in one point at the brain. If the standing position is correct, the body will be free from the burden because the distribution



Pict 1. Takbiratul Ihram during Pregnancy

In addition to Takbiratul Ihram, bowing movements can also help pregnant women strengthen pelvic muscles to support posture changes, strengthen abdominal muscles so that the elasticity of the abdominal muscles can be stable until entering labor. Research conducted by prof. H.A.Sabor showed that the bowing movement has tremendous benefits

for pregnant women. It can flex the joints in the spine. In pregnant women, the spine will support the bodyweight increase with increasing gestational age and the fetus. It can result in stiffness of the spinal joints and often causes discomfort like aches with bowing movements. It can have a relaxing effect. When bow, the spine (vertebrae) will be in a

good position because the joints between the vertebral bodies (*corpus vertebrae*) will feel a relaxing effect. So that the joints become soft and flexible, thus can facilitate the labor process later.

When in a bowing position, the heart position is parallel to the brain. It allows the blood to be pumped to the upper torso

maximally. So that the brain will not lack blood supply to carry out its function thus make a person think clearly, motivate himself to reassure the heart. A feeling of calm is an effective stimulant in stimulating fetal growth, both physical growth and brain, and other intelligence. Positive or not, fetal growth is affected by the calm feeling of the mother.



Pict 2. Ruku' during Pregnancy

The I'tidal movement benefits are, increasing the flow of O₂-rich blood from the brain to the stomach, improving transplacental circulation, blood circulation in the stomach, and stomach work. The movement can also lead to the alternating process of massage and loosening of the abdominal cavity to reduce the sensation of heartburn and meet the oxygen and nutritional needs of the fetus. The benefits of I'tidal movements for pregnant women can facilitate digestion. During pregnancy, there are drastic hormonal changes that also change its physical function, one of which is the digestive organs. Apart from hormonal changes, there are several other factors, namely low blood sugar levels, decreased gastric movements, and anxiety. Symptoms that often appear are nausea, vomiting, heartburn, and constipation. Research conducted by prof. H. A Saboe found that the I'tidal movement in prayer can stimulate natural bowel movements in pushing and removing food waste in the stomach of pregnant women so that it can facilitate the digestive tract. The recommended movement

is as perfect as possible is prostration. Ruku's position by placing both hands, knees, toes, and forehead on the floor is useful for smoothing the flow of lymph pumped to the neck and armpits.

When Prostrating, the heart position is directly above the brain, causing oxygen-rich blood to flow optimally to the brain. Not only that, when prostrating, the muscles in the stomach become straight and long, triggering contractions and increasing pressure so that it eases the pushing process when entering the second phase of active labor and can launch a bowel movement. The effect of Prostration for pregnant women and the fetus in addition to stabilizing emotions can also be related to their general physical condition. The Prostration movement can develop the chest muscles, form a mammae figure, and make the mammary glands wider, causing more milk production. If pregnant women do it correctly, their abdominal muscles will develop and grow. After delivery, the uterus immediately involutes the uterus. So the movement can accelerate

the process of uterine involution. A correctly performed Prostration can change the position of the breech fetus. The fetus in the buttocks position will rotate into the head position. Pregnant women who are prostrating will have their blood circulated into the uterus. Thus the uterus will get enough nutrition and food for

the fetus. The amount of blood flowing into the uterus can also clean the pollution in the uterus so that the fetus becomes more sterile and healthier. Therefore pregnant women are advised to extend the movement duration to make blood flow to the fetus increase.



Pict 3. Sujud during Pregnancy

The sitting position, between two Prostrations, when doing the initial Tahiyat, and sitting during the final Tahiyat are positions that can activate the groin muscles in which there is one of the large groin nerves. This nerve is right above the heels of the feet, covered by a muscle that functions as a cushion. With a sitting position like this, the heel will press on the muscles of the groin and the large groin nerves, giving a massage effect. This condition will improve the circulatory system and strengthen the perineal muscles.

Turn your face to the right and left as much as possible, until you see the side of the back. Salam movement is the last prayer movement performed. It is done by turning to the right and left while looking at the shoulder on that side. The benefits of the Salam movement are related to the neck. The neck has many vital parts, such as nerves, glands, blood vessels, muscles, bones, and others. Salam movements can maintain these parts. In addition, the Salam movement has the benefit of making the neck more flexible. The benefits of the Salam movement can also strengthen the muscles and the entire neck (Habibi and Hasbi, 2015). During pregnancy, the body of pregnant women can feel pain due to pressure on the

nerves, including the neck, so that by doing the Salam movement, it can flex these muscles (Habibi and Hasbi, 2015).

Based on table 2, the statistical test results show an effect of prayer movement on blood pressure ($p < 0.05$). One of the non-pharmacological treatments for anxiety and hypertension is physical exercise. One of the physical exercises that are safe for pregnant women is low-intensity exercises such as pregnancy exercise provide beneficial physiological effects for pregnant women. Pregnancy exercise has a positive effect on reducing depression in pregnant women. Pregnant exercise during pregnancy can significantly improve lower pain, feelings of discomfort and stress, and can improve the quality of life (Curtis, Weinrib and Katz, 2012; Berghella and Saccone, 2017).

Exercise recommended for pregnant women to maintain body health, fetus development, and keeping mother's emotions stable are walking, cycling, swimming, pregnancy exercise, hypnobirthing, and yoga. Prenatal exercise is a therapy in the form of activities or movements given to pregnant women to prepare themselves both physically and psychologically to keep the mother and

baby healthy. For primigravida and multigravida pregnant women, it is highly recommended to follow a pregnancy exercise program for the health of the mother and fetus (Smith and Campbell, 2013; Hinman et al., 2015; Berghella and Saccone, 2017).

Pregnancy exercise helps the mother to connect with the baby and her own body through deep practice and build awareness during the birth or delivery process. Physiologically, this yoga exercise will reverse the effects of the stress involving the parasympathetic part of the central nervous system. Pregnancy exercise will inhibit the increase in sympathetic nerves so the hormone that causes body dysregulation can be reduced in number. The parasympathetic nervous system, which has the opposite function of the sympathetic nerve, will slow down or weaken the work of the body's internal organs. As a result, there is a decrease in heart rate, breathing rhythm, blood pressure, muscle tension, metabolic rate, and the production of stress-causing hormones. As the levels of stress-causing hormones decrease, the whole body begins to function at a healthier level with more energy for healing, restoration, and rejuvenation. Thus, pregnant women will feel relaxed along with decreased anxiety symptoms (Hinman et al., 2015; Shohani et al., 2018; Soltani et al., 2019). Yoga also improves the self-control of pregnant women to face their labor (Curtis, Weinrib and Katz, 2012). It is the same with the research result By Rahayu et al., the provision of physical activity of yoga can improve self-control and quality of life for female students. There is a significant effect of yoga physical activity results on increasing self-control ($p = 0.001 < 0.05$) (Rahayu, Amalia and Damayanti, 2020)

There are many benefits of exercise movements. This research modifies the prayer movements as an exercise for pregnant women, given how special the prayer movement is. Following several research results, there are many benefits of the prayer movement when viewed from the health aspect of prayer, which can have a therapeutic effect on humans. By performing the prayer movements perfectly and correctly, the body organs will be healthy. It is due to it calming the soul or relaxing so that blood circulation becomes smooth and

the muscles in the body relax. These benefits can also be felt by pregnant women with their beloved children due to the therapeutic effect when it is done correctly, solemnly, intended to worship, and get closer to Allah SWT (Doufesh et al., 2014).

The rate at which blood flows through the entire circulatory system is the same as the rate at which the heart pumps blood, equal to the cardiac output. The contents of the heart rate are affected by the filling pressure (preload), the force generated by the heart muscle, and the pressure the heart has to resist when pumping (afterload). Normal afterload is related to aortic pressure for the left ventricle, and arterial pressure for the right ventricle. Afterload increases when blood pressure increases or when there is stenosis (narrowing) of the exit artery valve. An increase in afterload will decrease cardiac output if cardiac strength does not increase. Both heart rate and force generation are regulated by the autonomic nervous system (ANS). The relationship between pressure, resistance, and blood flow in the cardiovascular system is hemodynamic. The nature of this flow is very complex, but basically the smoother the circulation, the blood pressure will be normal. Exercise, including pregnancy exercise, can increase cardiac output which will be accompanied by an increase in oxygen distribution to the parts of the body that need it, while the parts that do not need oxygen will occur vasoconstriction, for example, the digestive tract. Increasing cardiac output will certainly affect blood pressure (Loomba et al., 2012; Smith and Campbell, 2013).

Understanding blood pressure on a person's level of anxiety is very varied. It had been argued if someone is experiencing anxiety, blood pressure will rise. Blood pressure increases and decreases depending on nutrition, sleep, movement, and perceived stress. Increased heart rate is one of the contributors to increased blood pressure. When experiencing anxiety, heart rate would increase. It is possible to pump blood to the part of the body that needs to fight or flee when threatened. But the increase in cardiac output causes an increase in blood pressure which raises systolic blood pressure, while diastolic is generally unaffected. Based on the statement above, we concluded that

blood pressure fluctuates randomly throughout the day because of power, diet, hydration, and more. Blood pressure is not constant, even if a person does not have any anxiety. Heart rate and blood pressure tend to be related to being anxious. Adjusting blood pressure with anxiety will eventually return to the base level. Changes in blood pressure tend to be high in the short term and usually occur in the early anxiety stages or during a panic attack. One indicator of a person's anxiety is by the increased blood pressure of that person, but we still need another instrument that can indicate the anxiety level of a person (Kusuma and Bin, 2017).

Based on table 2, the results of statistical tests show an effect of prayer movement on pregnant women's anxiety ($p < 0.05$). Apart from affecting blood pressure, the prayer movement also affects the anxiety of the third trimester of pregnant women. Anxiety in the 3rd trimester of pregnant women is an unpleasant emotional state, which is characterized by fear and stressful and unwanted physical symptoms experienced by pregnant women from the 28th to the 40th week of pregnancy (Thoma et al., 2013; Astuti and Hadisaputro, 2019).

Antenatal anxiety is considered a risk factor for maternal mental health problems, such as increasing the likelihood of postpartum depression. Furthermore, longitudinal studies have shown that babies born to pregnant women with high anxiety are at greater risk of developing behavioral problems in neonates and toddlers. Likewise, specific anxiety, such as fear of having a deformed baby, is associated with increased salivary cortisol in neonates. The mechanism of increased anxiety can trigger an adverse outcome, triggered by over-stimulation of the hypothalamus-pituitary-adrenal (HPA), with increased secretion of glucocorticoids such as cortisol. Some studies that link the increased risk of preterm birth to an increase in anxiety scores between the second and third trimesters (Ghiasi and Keramat, 2018; Schetter and Tanner, 2015).

In pregnancy exercise movement, there is a relaxing effect that can stabilize the emotions of pregnant women. Relaxation is very useful for reducing stress during pregnancy (Desmawati, Kongsuwan and Chatchawet, 2019; Rajeswari and Sanjeevareddy, 2020). Pregnant exercise

that is given regularly in the absence of very pathological conditions will be able to guide women to get complete calm and relaxation (Lalji et al., 2014). Physiologically, exercise will reverse the effects of the stress involving the parasympathetic part of the central nervous system (Barakat et al., 2011; Schetter and Tanner, 2015).

It happens because, during pregnancy exercise, it will inhibit the increase in sympathetic nerves so that the number of hormones that cause body dysregulation can be reduced. The parasympathetic nervous system, which has the opposite function of the sympathetic nerve, will slow down or weaken the work of the body's internal organs. As a result, there is a decrease in heart rate, breathing rhythm, blood pressure, muscle tension, metabolic rate, and the production of stress-causing hormones. As the levels of stress-causing hormones decrease, the whole body begins to function at a healthier level with more energy for healing, restoration, and rejuvenation. Thus, pregnant women will feel relaxed along with decreasing symptoms of anxiety (Barakat et al., 2011; Schetter and Tanner, 2015; Doufesh et al., 2014; Akbarzade et al., 2015; Rajeswari and Sanjeevareddy, 2020).

Prayer movements performed appropriately following the guidance of a therapist will help stimulate the joints of organs such as the neck, arms, fingers, wrist, knees, and feet. In addition, the prayer movement can also have a traction effect on the body muscles. The tension of the body muscles, especially blood vessels, will help blood vessels to return to elasticity (Kusuma and Bin, 2017; Desmawati, Kongsuwan and Chatchawet, 2019). The prayer movement modified for pregnancy exercise aims to reduce the anxiety felt by pregnant women. It is aligned with research results obtained. Takbiratul ihram with your hands together has tremendous benefits, especially for pregnant women and their fetuses. One of them is to foster an optimistic attitude. Pregnant women usually experience emotional instability like anxiety, fear, worry, and happiness. If the negative emotions cannot be handled properly, it will lead to depression during pregnancy. After Takbiratul Ihram, pregnant women are encouraged to recite prayers. This prayer can create a sense of optimism by hoping for the

goodness of Allah SWT and leaving it to the creator. When raising both hands for Takbiratul Ihram, then the hands together, the muscles in both elbows feel a relaxing effect. With this effect, the blood becomes smooth with the lymph nodes. Therefore, a relaxed body and a resigned mind will help foster a high sense of optimism (Conversano et al., 2010; Feng, Li and Chen, 2015).

Conclusion

Based on the results, there is an effect of prayer movement on the anxiety of third-trimester pregnant women and prayer movement effect on the blood pressure of third-trimester pregnant women. The advice given is that everyone's anxiety level is different and is affected by many factors, such as income, ethnicity, culture, place of residence, and so on. We hope that future research will be able to examine these factors. In addition, this prayer movement can be used as an alternative to exercise for pregnant women to support the physical and psychological conditions in the 3rd trimester because it can normalize blood pressure and reduce anxiety.

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Social Norms and Potency of Local Wisdom as A Social Enforcement of Smoking Behavior

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Abstract

Since 2013, the government of Denpasar City has adopted smoke-free law (KTR). However, the implementation of this law faces several obstacles, one of which is the high social acceptability of smoking in the community. Cigarettes and smoking have been deeply embedded within social and cultural life of the community and become part of the hospitality. Hence, this study aims to explore the social norms of smoking and the potency of local wisdom as a social enforcement for smoking behavior particularly at worship places. This study was a qualitative study located in four sub-districts in Denpasar. Informants and participants were selected purposively. Data was collected through in-depth interviews and FGDs. The study succeeded in interviewing 14 informants and conducting 3 FGDs. The results show that smoking in public places remains common among male, particularly adolescents and the elderly. Smoking behavior is perceived as group identity, however also considered less beneficial due to moral value. Community leaders also noticed smoking in public places. Hence, those leaders have important role to control smoking behavior in public places. Moreover, public education, supervision and enforcement should be considered to engage cultural approach and establish local policy which could accelerate the social enforcement in the community.

Introduction

The epidemic of tobacco and its products, especially cigarettes, is one of the greatest challenges to public health in the world. The World Health Organization (WHO) reports that smoking kills more than 7 million people per year worldwide, of which more than 6 million are active smokers and nearly 1 million are nonsmokers but are exposed to secondhand smoke known as passive smokers. Globally, one in three adults is a smoker, 80% of whom live in poor and developing countries (WHO, 2018).

Countries in Southeast Asia have 10% of the world's smokers and contribute to 20% of smoking-related deaths globally. Among these countries, Indonesia has the highest smoking population, namely 53.3% of all smokers

in the region, while Brunei has the lowest 0.06%. (Lian & Dorotheo, 2016). Based on the Indonesian Basic Health Research (Riskesdas) in 2018, the prevalence of smokers in Indonesia is 28.8%. Meanwhile, the prevalence of smokers in Bali Province is also quite high at 23.5% with 35.2% of adult males being smokers, while females are much lower at 0.6%. (Kemenkes RI, 2018). Meanwhile, Denpasar City has the highest prevalence among districts/cities in Bali, namely 27.4%. (Department of Health of Denpasar City, 2019).

Although Indonesia has not ratified the FCTC, various tobacco control efforts have been carried out by adopting the provisions and strategies in the FCTC. One of them

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is the government's policy regarding the determination of KTR. The Government of Denpasar City has implemented KTR by stipulating Regional Regulation (Perda) No. 7 of 2013 concerning KTR which regulates seven areas including: health service facilities, teaching and learning places, children's playgrounds, places of worship, public transportation, workplaces, and places of worship. general (Government of Denpasar City, 2020).

However, in its implementation, there are still many people who violate so that the level of compliance has not reached the target of 80%. The results of the 2015 survey showed that KTR compliance was also very low in places of worship (18.5%) and temples had the lowest compliance among the 5 places of worship (8.5%). (Suarjana et al., 2018). This result is quite alarming considering that Bali, including Denpasar City, is an area known as a thousand temples and there are often religious ceremonies at temples. The Government of Denpasar City then took action to increase compliance through socialization and installation of KTR signs. In addition, there have been initiatives to use a cultural approach, but these have not been implemented due to a lack of resources and examples regarding this approach.

In the social life of the people in Bali, it has become a habit to serve cigarettes and smoking behavior is often found in social activities and religious ceremonies performed at temples. In developed countries that have implemented KTR for a long time, compliance is already high due to individual awareness and social control mechanisms in society. Meanwhile, in developing countries, compliance is still low, due to cultural influences, especially social norms for smoking in society. In Indonesia the pro-smoking norm is more dominant and the KTR policy is still relatively new. Community and religious organizations in Indonesia have not yet united and moved to combat smoking behavior (Plaspohl et al., 2012).

Several studies show social norms are significant predictors of smoking behavior. So that in developing countries including Indonesia, its implementation must be carried out in conjunction with steps to change perceptions, social norms and smoking culture (Byron et al., 2019). Therefore, the exploration

of factors related to smoking behavior in Indonesia should include an assessment of social norms. There are two types of social norms that need to be considered, namely descriptive norms and command norms. One of the behavioral theories, namely the theory of normative social behavior (TNSB) explains how these two norms relate to each other, and how they correlate with behavior (Rimal & Real, 2005). Therefore, this study aims to explore smoking social norms according to TNSB in the area of temple worship and the potential of local wisdom as a social control of smoking behavior to increase compliance with KTR in Denpasar City..

Method

This study is a qualitative study to explore the social norms of smoking in the area of temple worship according to TNSB and the potential for developing local wisdom to encourage behavior change. The research was conducted from September to November 2019, which was located in 4 selected Traditional Villages in each sub-district in Denpasar City. Data were collected through semi-structured in-depth interviews and FGDs using modified interview guidelines and FGDs from various literatures (Rimal & Real, 2005; Byron et al., 2016). Informants and FGD participants were selected purposively with the type of maximum variation sampling (Creswell, 2009), to ensure varied information on smoking social norms, with maximum variation in sampling based on age, gender, smoking status, and role or position in society.

The research succeeded in interviewing 14 informants, namely: two traditional village leaders (Bandesa), two religious leaders, two heads of youth organizations, two smokers (1 adult and 1 teenager), two non-smokers (1 adult, 1 teenager), two women (1 adult and 1 teenager), 1 person from the Traditional Village Council of Denpasar City, and 1 person from the Department of Culture of Denpasar City. Meanwhile, FGD participants were recruited by field assistants and then grouped by smoking status and gender to ensure homogeneity. A total of 3 FGDs were conducted, namely in the group of women, adult smokers, and adolescent non-smokers with a total of 21 participants in 3

groups. All data from in-depth interviews and FGDs were recorded with the permission of the informants and participants, then transcribed verbatim.

Data were analyzed qualitatively using thematic analysis (Maguire & Moira, 2017). Thematic analysis is carried out in stages. First, the author of KS conducted a data analysis and then created a code that shows the important features of the data and is relevant to the research objective, namely to examine smoking social norms. The second step is generating, reviewing, and refining the theme, i.e. examining the code to identify meaning patterns as potential themes. Third, is the refinement of themes and sub-themes to build a coherent narrative based on the research

objectives. The second author (KHM) reviewed the final set of themes and sub-themes to check their fit with the data. The final step is to write the results of the analysis. The results of the analysis are presented with direct quotations from the interviews accompanied by the number and status of the respondents.

Results and Discussion

Most of the informants are male with an age range of 19 years to 56 years old. The informants are domiciled in traditional villages scattered in all sub-districts in Denpasar. The length of the interview varied with an average of 32 minutes. The longest interview time was 53 minutes and the shortest was 18 minutes (Table 1).

Table 1. Characteristics of In-depth Interview Informants

Code	Ages (years)	J K	Informant Status	Interview location	Interview duration
I.1	25	L	Youth figures	Informant's house	25:39
I.2	24	L	Youth figures	Kantor desa	28:23
I.3	56	L	Non-smoking adults	Informant's house	37:06
I.4	19	L	Non-smoking teens	Informant's house	20:29
I.5	26	P	Adult girl	Informant Figure	18:35
I.6	20	P	teenage girl	Informant's house	31:16
I.7	22	L	Teen Smoker	Village office	29:27
I.8	32	L	Adult smoker	Informant's house	35:01
I.9	56	L	Traditional Figures	Village office	40:05
I.10	52	L	Traditional Figures	District Office	36:53
I.11	55	L	Religin leaders	Informant's house	34:52
I.12	50	L	Religion leaders	Pura	30:35
I.13	55	L	Traditional Village Assembly	Informant's house	53:10
I.14	52	L	Department of Culture	Service Office Kebudayaan	26:38

Source: Primary Data, 2019

FGD participants were recruited at the banjar hall (hamlet) in traditional villages in the South Denpasar and East Denpasar sub-districts by field officers. Of the total 22 recruited participants, 21 people attended the

three FGDs, so that each FGD was attended by 7 participants, with 1 moderator and 1 note taker. The FGDs lasted an average of 50 minutes (Table 2).

Table 2. Characteristics of FGD Participants

JK and Status	Ages (years)	Recruitment place	Number of recruits	Number of Attendees	FGD Location	FGD duration
Adult female non-smoker	30 - 42	Banjar Hall	8	7	Banjar Hall Tegal Sari	45:12
Adult male smoker	40 - 55	Banjar Hall	7	7	Classroom	1:01:22
Male teenagers of non-smokers	17 - 20	School	7	7	Classroom	43:10

Source: Primary Data, 2019

The assessment of smoking social norms in this study is the first assessment of the concept of TNSB on smoking behavior in one of the public places used by the community to interact socially, culturally and religiously, namely a place of worship. TNSB explains that the influence of descriptive norms on individual behavior is moderated by perceptions of injunctive norms, outcome expectations, and perceptions of group identity. (Rimal & Real, 2005)

Opinions relating to what other people perceive to be doing (what people do) are defined as descriptive norms (Mead et al., 2014). In this study, the perceptions of informants and participants about the prevalence of smoking behavior in places of worship are classified as smoking descriptive norms. The results showed that smoking behavior in temples is a habit of adolescent and elderly men. The following is an example of a quote that shows this information, namely:

“...Remaja ya...ada juga yang tua, yang tua-tua banget. Tapi kalau orang yang umuran 30-40 sih enggak ya. Yang sepuh-sepuh karna mungkin dia lupa gitu ya, lupa dengan jati diri. haha... lupa mungkin dia ga tau mungkin jadi dia merokok di dalam. Kadang ada seperti itu saya liat ...” (Partisipan FGD 1)

“...Young people...there are also old ones, who are very old. But for people aged 30-40, no, yes. The old one because maybe he forgot that, he forgot his identity. haha... forgot maybe he didn't know maybe so he smoked inside. Sometimes I see something like that...” (FGD Participant 1)

Meanwhile, smoking behavior among women is said to be very small and almost no women in Bali smoke in public places, especially in places of worship. This result is consistent with other studies which also show that Indonesian women who smoke are usually reluctant to smoke in public, because it shows a bad image for them and is considered a naughty woman. So they will only smoke in public if they are with other smoking friends (Byron et al., 2016).

Teen smokers are said to dominate smoking behavior in temples. These results

are in accordance with several studies which show that adolescent smoking behavior is influenced by the behavior of their peers because psychologically adolescents are in the stage of wanting to try and imitate the behavior of their peers (Kamimura et al., 2018). Teens as well as the elderly who smoke said they often smoked where other people smoked too. This shows the direct effect of descriptive norms, namely the perception of the prevalence of smoking behavior on the desire and decision to follow smoking behavior (Zaleski & Aloise-Young, 2013). So, one approach that might be useful is to eliminate evidence that smoking has occurred in the area, for example by not providing ashtrays and cleaning cigarette butts. This can inform a new descriptive norm, namely there is no smoking activity in the area so that no one smokes there.

The results of interviews and FGDs also showed that smoking in the temple area according to them was not prohibited because they did not see any sign of a smoking ban. So that the installation of a standard no smoking sign is an important thing to do to increase public awareness of KTR and as a visual sign to prohibit people from smoking in that place (Navas-Acien et al., 2016). Here is an example of an interview excerpt:

“...ya itu dah, harus diterapkan harus istilahnya di sosialisasikan dulu atau gak kalau memang sudah ada hukumnya langsung di pasang didepan dilarang merokok sama kayak orang yang haid dilarang masuk, sama kaya begitu. Saya kira pasti orang pada tau, pasti tidak akan melakukan hal itu gitu...” (Informan 7, Remaja perokok)

“...yes, that's it, the term must be applied, the term must be socialized first or not, if there is already a law, it is directly sticked in front, it is forbidden to smoke, just like people who are menstruating are prohibited from entering, just like that. I think people will know, they definitely won't do that...” (Informant 7, Teenager smoker)

Smoking in the temple area is also considered not to harm others because the smoke will be directly related to the outside air. This opinion is of course wrong because in a prayer situation, many people gather, causing

high exposure to cigarette smoke. In fact, the prohibition of smoking in open spaces is now increasingly popular, such as in beaches and city parks. The ban on smoking in open spaces aims not only to protect people from exposure to other people's secondhand smoke but also to emphasize the importance of environmental health because cigarette butts are one of the most common pollutants found (Gallus et al., 2011). Besides that, other studies also show that the prohibition of smoking in open spaces aims to denormalize smoking norms, as well as to improve the quality of people's lives (Kennedy et al., 2012).

Several informants and participants also said that there were still many good cigarette sales around the temple area and some even entered the outer courtyard of the temple, thus triggering the number of people smoking in the temple area. Based on the KTR regional regulation of Denpasar City, the definition of KTR in places of worship including temples is that it is not allowed to smoke, produce, trade, and advertise cigarette products up to the outermost fence (Government of Denpasar City, 2020). But in fact, there are still many traders who sell cigarettes in the temple area. Of course, this makes people think that smoking is not prohibited in the temple area and even facilitated by the presence of cigarette sellers. Therefore, by prohibiting the sale of cigarettes within the temple area, you can also inform that smoking is no longer allowed in the area.

Society's perception of people in their environment who expect someone to follow or comply with a behavior (what people expected to do) is defined as injunctive norms (Mead et al., 2014). The results showed that people who smoked in the temple area had not received a warning or a ban from the community, traditional leaders, or religious leaders in the area. However, the informant also said that the community's rejection actually existed in the form of a warning but was still limited to friends and family. So if smokers are not family or close relatives, people usually choose to stay away from smokers to avoid offending. Here is an example of a quote:

“...Mungkin karna sudah banyak orang yang merokok jadi orang lain tu ya menganggap biasa ya..ya karna soalnya ya mereka mau

ngelarang juga atas dasar apa mereka melarang kecuali ya memang undang-undang yang melarang kaya peraturan-peraturan itu yang melarang kalau orang-orang pasti gak cukup kuat untuk melarang sesamanya dia maksudnya kayak temen-temennya dia atau orang lain apalagi kalau gak kenal...” (Informan 5, Perempuan dewasa).

(“...Maybe because there are many people who smoke, so other people think it's normal.. Yes, because the problem is, they want to ban it, on what basis do they prohibit it, except for the law that prohibits it. people are definitely not strong enough to ban each other, he means like his friends or other people, especially if you don't know...” (Informant 5, adult female).)

“...ya kalau misalnya dia merokok itu dengan sesama temannya yang suka merokok, nggak ada masalah kan gitu. Kemudian, sekalipun tidak temennya yang tidak merokok lalu dia merokok, disampingnya juga itu ndak ada persoalan. Nah kalau khusus untuk ibu-ibu yang ngajak anak kecil paling tidak dia menegur itu disuruh ya untuk jauh merokok, kalau melarangnya sih nggak. Ya disuruh jauh lah gitu dari tempat merokoknya...” (Informan 3, Dewasa non-perokok)

(“...yes, if for example he smokes with a friend who likes to smoke, there is no problem, right. Then, even if his friend doesn't smoke, then he smokes, besides that, there is no problem. Now, specifically for mothers who invite small children, at least they are told to stay away from smoking, if they don't, they don't. Yes, I was told to stay away from the smoking area...” (Informant 3, Adult non-smoker))

These results indicate that positive social norms towards smoking are still entrenched in society, especially in developing countries, which is consistent with the results of this study. Meanwhile, in developed countries, the application of KTR significantly reduces the social acceptability of smoking and the high social enforcement of smoking behavior in society (Rennen et al., 2014). In Indonesia, this situation has not been achieved because smoking has long been a part of social life and has become a social norm in society (Nichter et

al., 2009).

Furthermore, the high social acceptability of smoking behavior is also partly due to the massive marketing of cigarettes (Astuti et al., 2019). Giving cigarettes is part of the relationship as well as a tradition in almost every religious and customary event so that smoking behavior becomes very normative not only in society but also in domestic life. (Luntungan et al., 2016). Social acceptability is also demonstrated by avoiding people who smoke without reprimanding smokers because of concerns about violating someone's privacy, fear of conflict, and lack of support from other community members. (Fallin-Bennett et al., 2017).

According to informants and participants, the main motivation for them to still smoke at the temple is because it is a habit, so that in the waiting situation or after the prayer they immediately smoke even though they are still in the temple area. The temple as a place of worship for Hindus is one of the places or areas regulated by the local traditional village. Every activity in the temple area is regulated in customary rules or customary law. Some informants and participants revealed that if there is a local policy or customary law that synergizes with government policies in regulating smoking behavior, the community will become more obedient and will not dare to violate it because of the customary sanctions. Here is an example quote that shows this:

".. karena ini seperti yang saya bilang tadi hukum adat itu lebih efektif dia berlaku karena dia mengatur pada sanksi-sanksi adat itu nah sehingga dia kewibawaan hukum namanya lebih dihormati, nah itu. Nah sayangnya ini kan ya belum ada kebijakan lokal itu dari pemerintah. Ini kan biasanya di adat itu ketika ada persoalan-persoalan di pemerintah itu dibawa ke adat. Seperti tadi yang saya bilang Narkoba, HIV/AIDS itu juga kita udah buat pararemnya. Nah itu karena kita antara masyarakat adat atau desa adat ini dengan pemerintah ini biasanya kita saling ginilah bersinergi ya, bersinergi ini yang saya belum liat ini ada kebijakan dari pemerintah daerah seperti itu..." (Informan 11, Tokoh agama)

"...because, as I said earlier, customary law is more effective, it applies because it regulates

customary sanctions, so that legal authority is respected, now that's it. Now, unfortunately, there is no local policy from the government yet. This is usually customary when there are problems in the government, they are brought to adat. As I said earlier, drugs, HIV/AIDS, we have made pararem. Now that's because we are between this indigenous community or this traditional village and the government. Usually, we synergize with each other, yes, this synergy, I haven't seen this yet, there is a policy from the local government like that..." (Informant 11, religious leader)

Customary law in Bali is slightly different from the appeal or fatwa of religious leaders or community leaders, because it is a written rule that is produced through deliberation and community agreement and is accompanied by social sanctions that are consistently enforced (Windia & Sudantra, 2016). People in Bali who are mostly indigenous people usually obey this customary law more than the regulations from the government. So, this local wisdom or customary law can later become the command norm of smoking behavior in people's social life.

Belief in the benefits of smoking behavior in temples is explored from several questions related to benefits to one-self, to others (benefits to others), and benefits for anticipatory socialization. Most of the informants and FGD participants, both smokers and non-smokers, began to realize that there would be more benefits if they did not smoke at the temple. They say that people who do not smoke are considered more polite. Another benefit mentioned is that it can maintain the sanctity of the temple and make prayer more solemn for all the people who attend. Examples of quotes that show this are:

"...Kalo manfaat ya kita sebagai makhluk sosial ya apa ya istilahnya tahu sopan santun jadinya dan menjaga kesucian pura dan menjaga istilahnya apa ya kekusyukan orang sembahyang itu aja sih..." (Partisipan FGD 3)

"...If it's beneficial, we as social beings know how to be polite and maintain the sanctity of the temple and keep the worshipers solemn..." (FGD participant 3)

This is in accordance with the appeal of the Parisada Hindu Dharma Indonesia (PHDI Bali) as well as regulations from the Bali provincial government which emphasizes that the temple area is a holy place that is more than just clean but holy, meaning that in addition to keeping the environment clean, the behavior of the people in it must also be clean and healthy (Government of Bali Province, 2020).

The results showed that the informants and FGD participants also emphasized that smoking behavior was very small and even tended not to affect the community's ability to socialize in the temple area. So it can be said that both smokers and non-smokers can still get along or socialize well with all people in this area. Here are some sample quotes that demonstrate this:

"...ya itu gak ada pengaruh itu, maksudnya kalau orang merokok, keakraban itu tidak dilihat dari merokok itu. Orang merokok itu karna dia kebiasaan, tapi kalau kebiasaan itu dibiarkan kan dia menjadi jadi jadinya. Tapi kalau kebiasaan dibatasi, ya bertahap, ya jadinya kan dia tidak lah banyak merokok..." (Informan 10, Tokoh adat)

"...yes, it doesn't have that effect, it means that if people smoke, the intimacy is not seen from the smoking. People smoke because it's a habit, but if the habit is allowed, it will become what it is. But if the habit is limited, yes gradually, so he doesn't smoke much..." (Informant 10, traditional leader))

"...terkadang ada temen-temen yang perokok waktu berbicara dengan saya ada yang langsung mematikan rokoknya tapi ada juga yang menawarkan tapi hanya sekedar menawarkan dan kadang-kadang juga biasa aja merokok atau tidak merokok..." (Informan 2, Tokoh pemuda)

"...sometimes there are friends who smoke when talking to me, some immediately turn off their cigarettes but there are also those who offer but only offer (casual) and sometimes they also just smoke or don't smoke..." (Informant 2, Youth Leader))

This result is slightly different from research which says that smoking behavior in public places is caused by the assumption that it is easier to get along or socialize, especially

with peer groups. So that smoking is said to be a social lubricant in society, especially teenagers and young adults (Lipperman-Kreda & Grube, 2009). This benefit belief assessment shows that in general smokers still get a positive mood and enjoy the social benefits of smoking in temples, without any real negative personal and social impacts. Evidence shows that the high smoking behavior in public places can be caused by many factors such as the knowledge and attitudes of the community regarding aspects of the benefits of the KTR policy, the law enforcement system from the government, and no less important is the support from the area manager. (Wynne et al., 2018). The combination of enforcement that targets individuals and area managers, increased frequency and breadth of enforcement, consistent warnings and fines can have a powerful effect on changing beliefs about the benefits of smoking behavior.

Informants and participants' perceptions of group identity smoking behavior in temples were measured using questions related to individual aspirations to imitate others as references and the extent to which they perceive similarities between themselves and those references. The results of the study indicate that smoking behavior is influenced by the behavior in the group or the behavior is carried out by the leader or who is portrayed in the community so that they are aware of it, whether they want to or not, to follow this behavior. However, in general, informants and participants stated that smoking behavior had begun to be disrespected in the community based on their experiences in other areas regulated in the KTR Regional Regulation. Examples of quotes that state this are:

"...menurut saya sih, tergantung pandangan orang kalo misalkan dia memang ada keturunan gitu atau jiwanya keras gitu mungkin aja dia ngeliatnya sebagai panutan kaya "oh keren ya pemimpin itu duduk didepan sambil ngerokok..." (Informan 7, Remaja perokok)

("... in my opinion, depending on people's views, for example, if he really has descendants like that or has a hard soul, he might just see him as a role model like "oh that's cool, the leader is sitting in front while smoking ..." (Informant 7, teenage smoker))

"...kalau merokok di pura itu, artinya kalau model-model yang begitu-begitu kan tidak ada penghormatan bagi orang-orang seperti itu malah saya merasakan melihat dari teman-teman "wahh.. disitu dia merokok" begitu kadang-kadang ada seperti itu. Jadi kalau kita hormati itu malah kan aneh jadinya ya, kalau menghormati orang-orang seperti itu malah seperti yang saya bilang itu, sebaliknya itu lah terjadi "disitu dia merokok, kan rame disana..." (Informan 12, Tokoh agama)

"...if smoking in the temple, it means that there is no respect for people like that, even if I see from friends "wow.. there he smokes" so sometimes there are someone like that . So if we respect them, it's weird, right, if we respect people like that, it's like what I said, on the contrary, it happens "he smokes there, isn't it ,it will be big problem..." (Informant 12, religious leader))

These results are consistent with other studies showing that individuals in community-oriented cultures such as Indonesia may be strongly influenced by group identity (Byron et al., 2015). Smokers who smoke in public places facilitate inclusivity among their smoking friends, and may also do so to assert maturity. This was conveyed by one of the informants, namely smoking is a behavior that shows the maturity of a man or in other words that smoking shows that they are adult men. Here is a quote that shows this:

"...walaupun dilarang juga pasti mereka jawabnya "kan saya pakai uang sendiri bkn uang anda" karna seperti yang saya bilang tadi, ukuran sebuah kedewasaan itu dinilai dengan sebatang rokok jadi untuk terlihat dewasa pasti mereka merokok untuk dianggap dewasa..." (Informan 2, Tokoh pemuda)

"... even though it's forbidden, they will definitely answer "I use my own money, not yours" because like I said earlier, the size of an adult is judged by a cigarette, so to look mature, they must smoke to be considered an adult..." (Informant 2, Figure youth))

Research conducted in Bogor also shows that smoking behavior is still considered a

symbol of a man's virility and maturity so that if he does not smoke, his friends will consider him a sissy (Byron et al., 2016). This indicates that it will be very difficult for smokers, especially men, to comply with KTR because most men are smokers so that they will inspire each other and continue to smoke in public places including in the temple area. Anthropological research and analysis of cigarette advertising also confirms the relationship between smoking and masculinity (Kodriati et al., 2018). However, in general, people state that smoking behavior in the temple area has begun to be disrespected in the community.

The more aware smokers are that smoking behavior has begun to be dis-respected, it must be used as a momentum to change the perception of the relationship between smoking behavior and the maturity and inclusiveness of a group. Socialization or education to the community needs to be done with the right communication strategy and consider using a cultural approach. In addition, by providing education from an early age as part of lessons at school, it can potentially change the perception of the relationship between smoking and masculinity, maturity, and part of the association.

Another theme that emerged besides the concept in TNSB and closely related to social norms and smoking behavior in the community was the role of community leaders in relation to smoking behavior in the temple area. According to most of the informants and participants, the most important community leaders in a traditional village are the traditional village head (Bandesa) and their staff (prajuru). Other community leaders mentioned include: religious leaders village elders, village heads, politicians and philanthropists.. Here is an example quote that demonstrates this:

"...ada sesepuh desa. sesepuh kita sekarang punya ada Sabadesa, Sabadasa itu terdiri dari mantan-mantan Bandesa dan lurah. Kemudian tokoh masyarakat dalam konteks lain ada dia tokoh masyarakat tapi dia adalah anggota dewan, kita tokohkan juga dia. Tapi yang lebih berperan ada Sabadesa, ada kertadesa. Kertadesa itu yang memberikan nasehat kepada Bandesa, sebagai badan pertimbangan berkaitan dengan hukum-hukum adatnya itu..." (Informan 14, Dinas

Kebudayaan Kota Denpasar)

“...there is a village elder. Our elders now have Sabadesa, Sabadasa consists of ex-Bandesa and lurah. Then community leaders in other contexts, there are community leaders but he is a member of the council, we will also characterize him. But there are Sabadesa who play a more role, there are Kertadesa. It was Kertadesa who gave advice to the Bandesa, as a body of consideration regarding these customary laws...” (Informant 14, Denpasar City Culture Service))

In the life of the Indonesian people, community leaders occupy an important position, because they are considered all-knowing people and have a great influence on society. So that all his words and behavior is a pattern of rules that should be imitated by the community (Suhendi, 2013). Although the results of the study show that there are still many community leaders who smoke in the temple area, these figures are said to have a big role if they can carry out their roles well and become control of smoking behavior. Community leaders must be role models by not smoking in temples and educating their people not to smoke in temples and the most important thing is to supervise and take action for people or residents who smoke in temples. Here is an example of a quote:

“...perannya mereka itu sebagai apa ya mereka yang mensosialisasikan dan mereka juga ikut mengawasi kalau ada pengawas otomatis, sama kayak saya misalnya saya sebagai tokoh masyarakat terus saya bilang “tidak boleh merokok di Pura” otomatis pas kita ke pura ada orang liat mereka yang sepaham dengan saya pasti mereka gak akan merokok gitu ...” (Informan 8, Dewasa perokok)

(“...their role is as to what are they who socialize and they also supervise if there is an automatic supervisor, just like me, for example, I am a community leader and I keep saying “no smoking in temples” automatically when we go to the temple there are people who see them who agree I'm sure they won't smoke like that...” (Informant 8, adult smoker))

Some literature confirms that the existence of community leaders should not

be ignored. Their role as local leaders is highly expected as agents of change in the health sector along with other health cadres. Community leaders are the social capital of the community whose existence must be considered. Community leaders are expected to have high health literacy, so that they will be able to understand and make the best decisions towards a healthier society (Sinti, 2018).

Increasing community support, especially from community leaders, is an important aspect of effective KTR implementation. Research proves that one way of effective socialization and supervision is to involve community leaders including religious leaders and respected local figures to convey the message to the community. (Robertson et al., 2018). A study among Muslims in Malaysia also found that 30% of respondents agreed that an anti-smoking message from their religious leader would greatly motivate them to quit smoking (Yong et al., 2013).

However, on the other hand, the smoking status of community leaders can also hinder public compliance as found in Indonesia and from this study, when many local and religious leaders still smoke in public places, including in places of worship. This finding is in line with research in Bogor City which confirmed that adherence to religious teachings (fatwa), smoking religious leaders and inconsistent delivery of information were negative predictors of the effectiveness of religious fatwas on smoking behavior towards increasing KTR compliance (Byron et al., 2015).

The results of interviews and FGDs also showed another role of community leaders, especially traditional leaders led by the village council, namely developing a local wisdom or policy to strengthen the implementation of KTR in traditional villages. According to informants and participants, this is important because the fact is that the temple area is the authority of the traditional village where the temple is located and community leaders will be more courageous in carrying out enforcement and punishment based on this customary law. An example of a quote that reinforces this statement is:

“...iya, ini dah yang perlu kita jadikan suatu contoh sebenarnya dari tokoh-tokoh

masyarakat itu kan, terutama tokoh-tokoh adat itu ya, paling tidak kalau memang belum itu ada pararemnya ya berikan contohlah gitu atau kalau bisa inisiatifnya itu dibangun dari tokoh-tokoh masyarakat sendiri untuk nanti kesepakatan membuat sebuah pararem tentang KTR, itu itu lebih bagus lagi. Karena apa, karena hukum adat itu sifatnya tumbuh, hidup dan berkembang dari bawah masyarakat kalau udah seperti itu apa dalam proses pembuatan hukum adat itu, dalm bentuk pararem itu sangat efektif dia ketimbang disuruh dari atas itu dah itu... iya biasanya kalau sudah adanya anjuran daripada pemerintah, yang namanya prajuru desa itu pasti dia gini mensosialisasikan, menyampaikan dalam bentuk rapat-rapat paruman itu di desanya itu, nah soal dia mau taat dan nggak taatnya ini tergantung dari personalnya juga masyarakat itu, nah kalau dia mau mengerem lebih baik dibuatkan pararem gitu..." (Informan 13, Majelis Desa Adat Kota Denpasar)

"...yes, this is what we need to make into a real example of the community leaders, right, especially the traditional leaders. - the community leaders themselves will agree to make a pararem regarding KTR, that's even better. Why, because customary law grows, lives and develops from below the community. If that's the case, what in the process of making customary law, in the form of a pararem it is very effective, rather than being ordered from above, that's all... the government, whose name is the village prajuru, he must have socialized, conveyed in the form of the paroman meetings in his village, now the matter of whether he wants to obey or not, it depends on his personality as well as the community, so if he wants to brake, it is better to make a pararem. ..." (Informant 13, Denpasar City Traditional Village Council)

These results are in accordance with research by Echeverría et al. (2013), which emphasizes that cultural interventions or synergies with local policies are very important to increase compliance with KTR. This local wisdom or policy can be synergized with the local regulation of KTR, so that the community will become more obedient because of social sanctions. There are two local policies or also known as customary law in Bali, namely:

awig-awig and pararem. This customary law, especially pararem, is dynamic, grows and develops in Balinese society. When society changes because of the times, customary law develops in order to be able to protect its indigenous people. Besides that, Balinese customary law is more accommodating of the sociological dimension because of its socio-religious nature (Wiryanan, et. al., 2015).

Conclusions

The assessment of social norms for smoking in areas of temple worship according to the TNSB concept shows that smoking behavior is generally still accepted socially in the community, but it is felt that it is not too strong because public awareness has begun to grow about the moral and ethical aspects of smoking in places of worship. Smoking behavior is starting to be disrespected so that it is no longer a major prerequisite in socializing.

However, to increase public awareness into a social refusal (social enforcement), it is necessary to support it with prerequisites such as the presence of a no smoking sign and the abolition of smoking facilities. In addition, the community expects a big role from community leaders, both as role models in controlling smoking behavior and developing a local wisdom or policy that is believed to have the potential to further accelerate changes in smoking social norms. Future research is expected to quantitatively prove the influence of social norms according to TNSB on smoking behavior.

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Carpal Tunnel Syndrome Complaints in Female Packing Workers

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Abstract

The estimated prevalence of Carpal Tunnel Syndrome (CTS) in the general population is 1-5%. CTS can be experienced by workers who use hand strength at work. PT. X is one company that still uses manual labor in the process of packing soap and vermicelli. The purpose of this study was to determine the correlation between repetitive movements, wrist posture, age, history of illness, Body Mass Index (BMI), and years of service on CTS complaints. The research method used a cross-sectional study with a sample of 65 workers. Univariate, bivariate, and multivariate data analyses were using the chi-square and binary logistic regression test. Analysis of CTS complaints using a questionnaire and Phalen's test. The results showed that as many as 40 workers (61.5%) experienced complaints of CTS. The results of statistical tests showed that the variable BMI was the most influential factor for the complaints of CTS ($p = 0.031$). In addition, workers who experience CTS complaints can also be influenced by repetitive movement ($p = 0.024$), age ($p = 0.022$), and years of service ($p = 0.024$). To prevent the severity and relieve complaints of CTS, packing workers can do stretching, massage, independent acupressure massage, and maintain a healthy lifestyle.

Introduction

Demands for meeting the economic needs are increasing. It makes the production activity for goods or services increase. In the production process, human labor is still often used, especially in the packaging and transportation process. However, in human labor usage, there are limitations in both physical and non-physical abilities. Having an impact on the emergence of disorders called musculoskeletal disorders (MSDs). Sulaiman study concluded that MSDs are some of the most common health problems in the workplace around the world that can cause disability, reduced human performance, and reduced quality of life (Sulaiman, P, Ibrahim, & Nuhu, 2015). MSDs are a group of health problems in the function of muscles, tendons, and nerves. One example of an MSDs disorder is Carpal Tunnel Syndrome (CTS). CTS is a peripheral compression induced neuropathy, also known

as a set of symptoms caused by compression or injury to the median nerve in the wrist, and often occurs in working-age adults (A Rhode & Rhode, 2016; Cazares-Manríquez et al., 2020; Duncan, Bhate, & Mustaly, 2017; Newington, Harris, & Walker-Bone, 2015). Complaints or symptoms that often arise are pain, numbness, and tingling in the hands (Inji, Goddard, Khan, & Smitham, 2012).

The estimated prevalence of CTS in the general population ranges from 1 - 5% of the general population with an annual incidence of 72 per 100,000, while the CTS prevalence among workers is 1.7% to 21% of the population (Dale et al., 2013; Gyanchandani & Chaudhry, 2020; Jenkins, Watts, Duckworth, & McEachan, 2011). From 2007 to 2014, as many as 139,336 cases of workers in California were reported to have suffered from CTS (6.3 cases per 10,000 full-time workers) with a high risk, especially in the clothing industry, food, and beverage

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packaging, as well as administrative work in offices where workers do repetitive movements or maintaining an unergonomic work posture (Jackson, et al., 2018).

Based on the data mentioned in previous paragraphs, it can be concluded that there is a positive correlation between jobs involving repetitive hand movements and the incidence of CTS. However, the prevalence of occupational diseases, especially CTS in work problems in Indonesia, is not yet known. It is because there are still very few, even no occupational diseases, reported either to companies, health facilities, or the government. The prevalence of CTS cases in Indonesia can be seen in several previously mentioned study data. According to a previous study, most of the respondents diagnosed with CTS were women (80,4%) and people aged 40-60 years old (67,4%) (Emril, Zakaria, & Amrya, 2019). However, other research states that CTS for men and women is not significantly different, especially if the work is the same (A Çirakli & Ekinici, 2018). That is until a follow-up study was conducted to determine the differences in male and female risk factors for CTS by measuring the cross-sectional area of the carpal tunnel. As a result, the average cross-sectional area of the female carpal tunnel is smaller than that of men ($p < 0.05$). Therefore, in theory, this could be a significant factor (Sassi & Giddins, 2016).

The prevalence of CTS including in Batik workers in several studies is 43.96% among female subjects aged 36-50 years old, has a working period of more than five years, and standard body mass index (Setyaningrum et al., 2019), and 68,8% among females aged 36-45 years old, with work period of more than ten years, and having a high-risk work attitude (Khomairoh & Widajati, 2020). Bahrudin also argues that CTS is influenced by mechanical and vascular factors such as BMI, gender, age, and history of illness (Bahrudin, 2011). The occurrence of CTS is characterized by the appearance of sensations such as tingling and numbness, as well as increased weakness in the muscles (Wolny, Linek, & Saulicz, 2019). In addition, years of work are also a risk factor as workers engage in increasingly frequent repetitive movements that can cause

compression of the carpal tunnel network.

Work in goods packing is one of the occupations having the CTS potential, especially those that still use human labor to perform statical repetitive movements. The same study was carried out on workers in the sauce and soy sauce industry in Karanganyar. They installed bottle caps using a press machine with hand power. It was stated that workers often complained of pain, fatigue, and numbness in the arms (Setyawan, 2017).

PT. X is one of the companies that still use humans in the packaging of soap and vermicelli. Work positions are mainly standing and bending down with monotonous wrist movements that include outreaching, grasping, and transporting goods. Based on preliminary observations, these movements make workers often feel pain and tingling in their wrists. Therefore, further research is needed to determine the correlation between repetitive movements and wrist posture as well as individual characteristics such as age, BMI, medical history, and length of service with complaints of CTS.

Method

This study is an observational analytic study with a cross-sectional study design to determine the correlation between the independent variable (risk factor) and the dependent variable (impact) by measuring and assessing it at one time. The total sample was 65 workers in soap and vermicelli packing activity at PT.X. All are female. Univariate, bivariate, and multivariate data analysis used the chi-square and binary logistic regression statistical test. CTS complaints in workers were analyzed using a modified Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) questionnaire and conducting a Phalen test to determine the occurrence of complaints carried out for 60 seconds by flexing both palms at an angle of 90° with the help of a physiotherapist. In addition, a RULA assessment observation sheet was used to measure wrist posture, stopwatch, and job scoring tables was used to measure repetitive movement, as well as a Mechanical Stadiometer to measure the worker's height and weight.

Result and Discussion

This research was conducted at PT. X in the packing section involving repetitive movements of the wrist. Based on the univariate results, there were 40 out of 65 packing workers who experienced CTS complaints (61.5%), 41 workers doing repetitive movements of ≥ 30 actions in one minute (63.1%). 37 whose wrist posture was in a high-risk level based on the assessment using the RULA method (56.9%), 48 are aged ≥ 30 years old (73.8%), 16 had an abnormal body mass index (24.6%), 20 had a history of illness (30.8%), and 41 had a work period of ≥ 4 years (63.1%) (Table 1).

The bivariate analysis found that the repetitive movement variable (p-value = 0.024), age (p-value = 0.022), BMI (p-value = 0.031), and years of service (p-value = 0.024) were statistically related to CTS complaints. Whereas wrist posture (p-value = 0.373), and history of illness (p-value = 0.510) were not statistically associated with complaints of CTS (Table 2).

Table 1. Univariate Analysis

Variables	n = 65	%
CTS complaint		
Yes	40	61.5
Not	25	38.5
Repetitive Movement		
Yes (≥ 30 actions in 1 minute)	41	63.1
No (< 30 actions in 1 minute)	24	36.9
Wrist Posture		
High Risk	37	56.9
Moderate Risk	28	43.1
Age		
≥ 30 Years	48	73.8
< 30 Years	17	26.2
BMI		
Abnormal (> 25 or < 18 kg / m ²)	16	24.6
Normal (18.5 - 25 kg / m ²)	49	75.4
History of Illness		
Has History of Illness	20	30.8
No History of Illness	45	69.2
Years of service		
≥ 4 years	41	63.1
< 4 Years	24	36.9

Source : Primary Data, 2020

Table 2. Bivariate Analysis

Variables	CTS Complaint				p-value	PR (95% CI)
	Yes		No			
	N	%	N	%		
Repetitive Movement						
Yes	30	73.2	11	26.8	0.024	3,818 (1,315 - 11,084)
Not	10	41.7	14	58.3		
Wrist Posture						
High Risk	25	67.6	12	32.4	0.373	1,806 (0,565 - 4,970)
Moderate Risk	15	53.6	13	46.4		
Age						
≥ 30 Years	34	70.8	14	29.2	0.022	4,452 (1,377 - 14,394)
< 30 Years	6	35.3	11	64.7		
BMI						
Abnormal	14	87.5	2	12.5	0.031	6,192 (1,270 - 30,192)
Normal	26	53.1	23	46.9		
History of Illness						
Has History of Illness	14	70.0	6	30.0	0.510	1,705 (0,554 - 5,250)
No History of Illness	26	57.8	19	42.2		
Years of service						
≥ 4 years	30	73.2	11	26.8	0.024	3,828 (1,315 - 11,084)
< 4 Years	10	41.7	14	58.3		

The results of the multivariate analysis showed that the BMI variable was the most influential factor to CTS complaints among female packing workers at PT.X (p-value = 0.031). The final modeling results showed that

workers with an abnormal BMI (> 25 or < 18 kg/m²) have a 6.9 times higher risk of experiencing CTS complaints compared to workers with normal BMI (18,5-25 kg/m²) after being controlled by the repetitive movement variable,

age, and years of services. In addition to the BMI variable, the multivariate test results also showed that years of service were associated with CTS complaints (p-value = 0.048). With

a 95% degree of confidence, workers with ≥4 years of service have 3.4 times higher risk than workers with < 4 years of service to experience CTS complaints.

Table 3. Final Modeling in Multivariate Analysis

Variables	B	p-value	OR	95% CI
Repetitive Movement	1.030	0.104	2.802	0.809-9.704
Age	1.083	0.118	2.953	0.760-11.466
BMI	1.929	0.031*	6.881	1.193-39.697
Years of services	1.224	0.048*	3.401	1.013-11.419
Constant	-2.050	7.022		

*: Significant

The multivariate test results can be made into a model to determine the probability of workers experiencing CTS complaints. The results of the Hosmer and Lemeshow Test showed the number 0.740 (p-value>0.05). It means that the model below is per the actual

situation. A worker with an abnormal BMI has ≥4 years of service, performs ≥30 actions of repetitive movements in 1 minute, and is ≥30 years old has a 96% chance of experiencing CTS complaints.

$$CTS = \frac{1}{1 + e^{-(-2.050 + 1.929 BMI(Abnormal) + 1.224 Years of Service (\geq 4 \text{ years}) + 1.030 Repetitive Movement (Yes) + 1.083 Age (\geq 30 \text{ years}))}}$$
(1)

The results showed that as many as 40 workers (61.5%) complained of tingling and pain in the wrists after conducting the Phalen test and interview for symptoms using the BCTQ questionnaire. Complaints are experienced while working and finishing work due to the repetitive movements' frequency for a long time with flexion and extension movements during packing activities. This result is per the study by Musolin which stated that 42% of workers who work in the production section experience CTS characterized by decreased nerve conductivity and the onset of symptoms (Musolin, Ramsey, Wassell, Hard, & Mueller, 2014). Symptoms and signs of CTS are caused by compression (pressure) on the median nerve in the carpal tunnel (Gyanchandani & Chaudhry, 2020). Symptoms of CTS include paraesthesia (tingling), numbness, and pain in the hands which are also caused by temporary ischemia of the compressed median nerve (Zamborsky, Kokavec, Simko, & Bohac, 2017). Workers can do stretching for the muscles in the wrists, hands, and arms areas to prevent

and relieve symptoms of CTS. A study by Shem stated that a self-myofascial stretching of the carpal ligament could be a relatively modest treatment option for people with CTS (Shem, Wong, & Dirlikov, 2020).

Repetitive movements are movements in work activities carried out repeatedly, as many as 73.2% of the packing workers at PT. X doing repetitive movements has complaints of CTS. Determination of repetitive motion assessment of the wrist is carried out based on the riskiest limb used in packing activity which is the right hand. The results of this study indicate that there is a statistical correlation between repetitive movements and complaints of CTS in packing workers (p-value = 0.024). While the multivariate results show that repetitive movements are one of the confounding variables. The repetitive movements carried out by the female packing workers include outreaching, packaging, and transporting goods to the collection point. From the results of observations and calculations using a stopwatch, it was found that the total frequency

of repetitive motion actions performed by packing workers was 25 to 47 times per minute, with an average above ten times. Working hours start from 8 am to 4 pm so that workers perform repetitive movements for 7 hours per day and 42 hours per week.

This study is in line with the Newington which concluded that there was a positive correlation between CTS and work that involved the highly repetitive movement of the hands (Newington et al., 2015). In theory, rapid repetitive movements involving the wrist joint performed every day at work more than 30 times a minute can cause tendinitis (inflammation of the tendons) that results in compression of the nerves, affecting the blood supply to the hands and wrists (Mallapiang & Wahyudi, 2014). Repetitive movements over a long period can also cause stress to the network around the carpal tunnel which causes the carpal tunnel to become narrow (Setyowati, Dwijayanti, & Sultan, 2015)

Wrist posture is a vital element in work activities. The posture can affect the concentration and productivity of workers. As many as 67.6% of packing workers have a high-risk level and experience complaints of CTS. The results of this study indicate that there is no statistical correlation between wrist posture and complaints of CTS (p-value = 0.373). Based on the observations, the absence of this correlation is due to the unergonomic wrist posture carried out by the packing workers was not maintained for a long time because they still have to perform various other movements causing the wrist position to change repeatedly. The non-ergonomic posture that is done is when the wrist is in a position of flexion and extension during the activity of packing soap and vermicelli.

Though the statistical tests did not show any correlation, study data showed that most of workers who experienced CTS complaints and wrist posture were at high risk (67.9%). These results indicate that wrist posture can be a risk factor for CTS complaints in workers if this factor is not controlled. A study by You found that prolonged non-neutral wrist postures created two times increased risk for CTS compared to non-neutral wrist posture in a short period (You, Smith, & Rempel, 2014).

Extension of the wrist causes pressure on the dorsal retinaculum extensor. It increases space in the volar carpal ligament on the volar side, which then pushes the volar carpal ligament out of the carpal bone. The dislocated volar carpal ligament causes additional pressure in the carpal tunnel. When the wrist is in a flexed posture, the flexor of the retinaculum compresses the flexor of the tendons beyond its radius. This pressure results in additional pressure on the fluid and will affect the movement of the flexor tendons. This movement causes internal friction (shift), which can affect the median nerve (Duncan et al., 2017).

Age is a number that describes the length of a person's life from birth to the research was conducted. Based on the results, workers aged ≥ 30 years experienced more CTS complaints, namely as many as 34 people (70.8%). The results of this study indicate a statistical correlation between age and complaints of CTS (p-value = 0.022). While the multivariate analysis showed that age is one of the confounding variables. It is in line with Zyluk's research that there is a correlation between age and CTS with the highest number of patients was in the age range of 40 - 65 years (Zyluk & Puchalski, 2013).

Bray's theory states that age is one of the risks closely related to CTS because of the reduction in the synovial fluid causing swelling of the joints as a person gets older (Bray, 1985). A person aged ≥ 30 years will also experience degeneration, including tissue damage, formation of scar tissue, and a reduction in the fluid, which causes the stability of bones and muscles to decrease (Ashworth, 2010). In addition, the potential for increased risk of CTS is also associated with axon loss, development of nerve conduction, and blood vessel abnormalities because the older a person is, the more disease complaints are felt, especially those who work in places that require excessive energy (Komurcu, Kilic, & Anlar, 2014)

BMI is a condition that shows a person's nutritional status, obtained by calculating calculating the ratio between body weight and height. The Ministry of Health of the Republic of Indonesia classifies the BMI range into 3, namely underweight (<18 kg/m²), standard (18.5-25 kg/m²), and overweight (>25 kg/m²), while in this study the BMI range was

divided into 2 i.e. abnormal BMI is in the range >25 or <18 kg/m² and normal BMI is in the range of 18.5-25 kg/m². Based on the results through measurement of height and weight calculated using the formula, 14 packing workers who had an abnormal BMI (87.5%) had complaints of CTS. The results of this study indicate a statistical correlation between BMI and complaints of CTS (p-value = 0.031). The multivariate results showed that BMI is the influential factor for CTS complaints among female packing workers at PT.X. Study by Shiri stated that overweight and obesity can increase the risk of CTS by 1.5 and 2 times higher (Shiri, et al, 2015).

The American Obesity Association states that 70% of all CTS sufferers are overweight. Excess body weight (abnormal BMI) was reported as a risk factor for CTS (Shiri et al., 2015). The over-weight condition can lead to an increase in fluid accumulation in the carpal tunnel network. BMI has also reported as a risk factor for CTS because of a causal relationship between CTS and BMI due to increased fat tissue in the carpal tunnel or increased hydrostatic pressure across the carpal tunnel in obese individuals (Ghali, Murugasu, Day, & Nicholls, 2012; Shakir Eman A, 2017). A motor and sensory study on 38 obese CTS patients also stated that obesity could cause severity in the carpal tunnel network (Mansoor et al., 2017). Therefore, weight loss can be a therapy for CTS sufferers as well as a preventive measure by maintaining health.

History of illness is a person's experience with certain diseases. 14 packing workers had a history of illness and had complaints of CTS (70.0%). The results of this study indicate that there is no statistical correlation between illness history and complaints of CTS (p-value = 1.705). It means that a person who has a history of illness that causes CTS (diabetes mellitus, rheumatoid arthritis, wrist trauma, and fractures) does not always suffer from CTS. However, it is different from other studies which state that a history of illness can cause complaints of CTS such as rheumatoid arthritis, which causes tingling sensations in the morning, diabetes mellitus which can cause focal demyelination accompanied by axonal damage due to compression in the carpal

tunnel, fractures or dislocations due to synovial inflammation and fibrosis in tenosynovitis, fractures of the carpal bones, and thermal injuries to the hands or forearm (Solmaz et al., 2017).

Years of service is the total working time a person has in a workplace from when they first start working until currently. Packing workers who have years of service of ≥ 4 years and experience CTS are 30 people (73.2%). The results of this study indicate a statistical correlation between years of service and complaints of CTS (p-value = 0.024). After the multivariate analysis, it was found that years of service was one of the factors that influenced CTS complaints (p-value = 0.048) after being controlled with repetitive movement variables, age, and BMI. This study is in line with the research of Riccò in female workers in visual display units where there is a correlation between years of service and an increased risk of CTS (p-value = 0.019) (Riccò, Cattani, & Signorelli, 2016). Khoimaroh and Widajati's study also states that years of service is associated with CTS complaints because of repeated and excessive hand and finger movements through the years (Khomairoh & Widajati, 2020).

A person who works in a workplace exposed to repetitive movements within ≥ 4 years has a higher proportion of CTS because the increasing number of working years will increase the amount of time to do repetitive activities (Burt et al., 2013; Setyowati et al., 2015). CTS is a musculoskeletal disorder that does not have an immediate impact but takes time and is caused by continuous exposure to risk factors for a long time. Repetitive hand movements cause a two times higher risk of developing CTS. Because the longer the working period, the more frequent repetitive movements will occur, causing compression of the tissue around the carpal tunnel. The injuries can occur in months or years, depending on the severity or severity of the trauma.

Conclusion

Packing workers at PT. X experiencing CTS complaints was 61.5%. The results of the bivariate analysis showed that repetitive movements, age, BMI, and years of service

were associated with CTS complaints, while the results of the multivariate analysis showed that BMI was the most influential factor for CTS complaints (p-value = 0.031). To prevent the severity and relieve complaints of CTS, workers are expected to carry out a series of stretching movements on the wrist for 5 minutes every 3-4 times a day, do a massage or small massage on the wrist by opening the narrowed carpal tunnel, perform “acupressure” massage by pressing around 2-3 fingers under the palms of the hands for 30 seconds, as well as providing dissemination about the cultivation of a healthy lifestyle to the workers so that they always maintain an ideal weight.

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The Factors Affecting the Unmet Need of Family Planning in Banten Province Year 2019

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Abstract

The result of Program Accountability Performance Survey (SKAP) year 2019 showed that the data of unmet need of Family Planning comprised 13.9%. It was higher than the result of national SKAP year 2019 which was 12.1% and did not achieve the target of the Strategic Plan 2015-2019 which was 9.91%. The study aimed to investigate the factors affecting the unmet need of Family Planning in Banten Province year 2019. The research method used was quantitative approach with Cross-Sectional research design. The population consisted of all women of childbearing age who did not apply Family Planning listed in SKAP of National Department of Demography and Family Planning (BKKBN) of Banten Province year 2019. The number of samples was 343 respondents. The sampling technique used was total population. The data collection was done using secondary data obtained from the data in SKAP of BKKBN of Banten Province year 2019. The data analysis implemented was univariate, bivariate using chi square, and multivariate using Multiple Logistic Regression Test. The unmet need of Family Planning on the women of childbearing age was 14.0%. Most age of the respondents that was \geq mean 37.78 years old was found in 182 (53.1%) respondents, married status in 341 (99.1%) respondents, middle family income in 185 (53.9%) respondents, rural residential area in 197 (57.4%) respondents, high-level knowledge \geq mean 7.10 in 196 (57.1%) respondents. The result of bivariate analysis showed that age had effect on unmet need of Family Planning (p value = 0.000). The variable of marital status, family income, residential area, and knowledge had no effect on unmet need of Family Planning. The dominant factor affecting unmet need of Family Planning was age (p value = 0.000; OR = 6.397).

Introduction

Cases of maternal death that keeps increasing from year to year can be prevented by implementing Family Planning Program, especially for mothers with 4T conditions, namely too young when giving birth (younger than 20 years old), too often giving birth, too close interval of giving birth, too old when giving birth (older than 35 years old). Family Planning is an effort which is useful to plan the number of family members by limiting that can be done using contraception such as condoms, spiral, Intra Uterine Devices (IUD), and so on (Sahasrabuddhe et al., 2018). Family planning is also one of national priority programme to

decrease maternal and infant death and also it can help improvement in maternal and child health (Asif & Pervaiz, 2019; Misnaniarti & Ayuningtyas, 2016). One of the obstacles in the implementation of Family Planning program is the unmet need of Family Planning on women of childbearing age. The decrease of the unmet need of Family Planning is one of the national development goals in National Medium-Term Development Plan (RPJMN) 2015-2019. Unmet need is an estimation of size and composition of women's population whom their contraceptive needs is not fulfilled. Women with unmet need for family planning include fecund women who do not use any kind of contraceptive but

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who wish to postpone the next birth (spacing) or stop childbearing altogether (limiting) (Misnaniarti & Ayuningtyas, 2016).

The problem of unmet need of Family Planning indicates the gap between women's reproductive goals and their contraceptive behavior. It means that women have a desire to avoid pregnancy but they do not take any actions to avoid pregnancy. Many aspects underly the conditions, such as women's disability access to family planning services, discomfort, restrictions or availability, and cost (Machiyama et al., 2017). Based on the result of Family SKAP year 2019, nationally the number of unmet need of Family Planning year 2019 was still the same as the previous year, namely 12%; consisting of 12% for purpose of birth thinning and 0.3% for restriction, decreased from the achievement in year 2018. The achievement of unmet need of Family Planning year 2019 was still far from the determined national target of strategic plan 2015-2019, i.e. 9.91 percent. There were 15 provinces with percentage of unmet need of Family Planning above the national (higher than 12.1 percent) including Aceh, Riau, South Sumatera, West Java, Banten, West Nusa Tenggara, East Nusa Tenggara, North Kalimantan, Central Sulawesi, South Sulawesi, Southeast Sulawesi, Maluku, North Maluku, Papua, West Papua. The result of SKAP 2019 showed the data on the unmet need of Family Planning of Banten Province for 13.9 percent, including the unmet need of Family Planning for birth thinning for 13.7% and the unmet need of Family Planning for birth restriction for 0.3%. The number of unmet need of Family Planning of Banten Province in 2019 tended to increase for 1.2% compared to the unmet need of Family Planning in 2018 for 12.7% (BKKBN, 2018).

The result of Demographic and Health Survey in Indonesia year 2017 in showed that the percentage of married women with unmet need of Family Planning was highest in age group of 45-49 years old (14%). The unmet need of Family Planning on married women was not far different between groups. 11% of married women in cities had unmet

need of Family Planning compared to 10% of women in village. The unmet need of Family Planning (%) reached 59.09% (Misnaniarti & Ayuningtyas, 2016). The causing factors included: communication, information, and education done so far could not respond to the main needs of the people, educative materials related to complication, side effect, and failure; the non-optimal service of mobile Family Planning in remote areas, border area, and the outermost islands; non-optimal supply chain; limitedness of information especially from field officers (Idris, 2019).

BKKBN tries to decrease the number of unmet need because it is one of the causes of 75% of maternal death in Indonesia and in the world. Maternal death in Indonesia is estimated to increase to be 359/100,000 live birth and if the unmet need is not handled immediately, the number will increase. Women of reproductive age who do not use Family Planning have a great chance of getting pregnant and suffering from complication during pregnancy, delivery, and childbirth. It can be caused by abortion due to unwanted pregnancy, close pregnancy interval, giving birth too many times, or complication of disease during pregnancy, complication during delivery, and complication during childbirth (Paulus & Lette, 2019). The study conducted by (Bhattathiry M Malini dan Ethirajan Narayanan, 2014) in the cities of Tamil Nadu showed the prevalence of unmet need of Family Planning for 39%. The main reasons of unmet need of Family Planning in the married were perception of low pregnancy risk (18%), fear of side effects of contraception (9%), lack of information about contraception (5%), opposing husbands (4%), and medical reasons (3%). The study conducted by Sedgh et al. (2016), stated that the 2 reasons for women of childbearing age who did not use contraception despite wanting no more children were irregular sexual activity and fear of side effect of contraception. In addition, they felt that there were only few options of contraception, inadequate counseling, and lack of knowledge about Family Planning.

Method

The method used in the study was quantitative approach. The type of the study was analytical survey, namely a survey or study trying to explore how and why a medical phenomenon occurred. Then it analyzed the dynamic of correlation between the phenomena or between the risk factor and the effect factor. The cross-sectional research design is a study to learn the dynamic of correlation between the risk factors with effect of approach, observation, or data collection at the same time (point time approach), it means that each research subject is only observed once and the measurement is done on the status of character or variable of subject during investigation.

The samples of the study were women of childbearing age who did not use Family Planning in the data of SKAP of BKKBN of Banten Province year 2019. The sampling technique was total population where the entire existing population in the data of SKAP of BKKBN of Banten Province in 2019 was taken as the samples. The inclusion criteria in the study were women of childbearing age and had complete data in SKAP of BKKBN of Banten Province year 2019. The exclusion criteria in the study were women of childbearing age who wanted to have children soon, could not get pregnant, and were not allowed to use Family Planning.

The samples that did not meet the inclusion criteria in the study were 343 respondents. The study was conducted in Banten Province in July-October 2020. The independent variables in the study were: Age, Marital status, Family income, Residential area, Knowledge of women of childbearing age about Family Planning methods. The instrument used in the study was the raw data of woman questionnaire and family questionnaire that was the result of SKAP of BKKBN of Banten Province in 2019, then the researcher selected some questions in the questionnaire in accordance with the variables to be studied. The data collection method in the study was by analyzing secondary data in the raw data of woman questionnaire and family questionnaire that was the result of SKAP of BKKBN of Banten Province year 2019. The data processing used editing and coding, and then the data were

analyzed using univariate analysis, bivariate analysis using Chi-Square test, and multivariate test using Multiple Logistic Regression.

Result And Discussion

Based on the result of data processing, the following result of the study was obtained:

Table 1. Distribution of Respondents' Characteristic

Variable	n	%
Age		
≥ Mean 37.78 years old	182	53.1
< Mean 37.78 years old	161	46.9
Marital Status		
Married	341	99.4
Living together with partner	2	0.6
Family Income		
Low	115	33.5
Middle	185	53.9
High	43	12.5
Residential Area		
Village	197	57.4
City	146	42.6
Knowledge		
Low, < Mean 7.10	147	42.9
High, ≥ Mean 7.10	196	57.1
Unmet Need of Family Planning	48	14.0
Met Need of Family Planning	295	86.0

Between age on unmet need of Family Planning on women of childbearing age, it was found that among the respondents of age ≥ 37.78 years old, 41 of them (22.5%) had unmet need of Family Planning, while among the respondents of age < 37.78 years old, 7 of them (4.3%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.000$ and there was a significant difference between the proportion of unmet need of Family Planning on women of childbearing age of ≥ 37.78 years old and < 37.78 years old, so age had an effect on unmet need of Family Planning on women of childbearing age. From the result of analysis, it obtained value of $OR = 6.397$; it means that the respondents of age ≥ 37.78 years old had a chance of unmet need of Family Planning 6.3 times as much as the respondents of age < 37.78 years old.

Between marital status and unmet need of Family Planning on women of childbearing age, it was found that among the married respondents, 48 of them (14.1%) had unmet need of Family Planning, while among the

respondents who lived together with their partners, 0 of them (0%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 1.000$ and there was no difference of unmet need of Family Planning between the married respondents and the respondents who lived together with partner, so marital status had no effect on unmet need of Family Planning.

Between family income and unmet need of Family Planning on women of childbearing age, it was found that among the respondents with low family income, 13 of them (11.3%) had unmet need of Family Planning, among the respondents with middle family income, 30 of them (16.2%) had unmet need of Family Planning, and among the respondents with high family income, 5 of them (11.6%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.438$ and there was no difference of unmet need of Family Planning among the respondents with low, middle, and high family income, so family income had no effect on unmet need of Family Planning.

Between residential area and unmet need

of Family Planning on women of childbearing age, it was found that among the respondents who lived in village, 23 of them (11.7%) had unmet need of Family Planning, while among the respondents who in city, 25 of them (17.1%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.200$ and there was no difference of unmet need of Family Planning between the respondents who lived in village and the respondents who lived in city, so residential area had no effect on unmet need of Family Planning.

Between knowledge and unmet need of Family Planning on women of childbearing age, it was found that among the respondents with low knowledge <mean 7.10, 22 of them (15.0%) had unmet need of Family Planning, while among the respondents with high knowledge \geq mean 7.10, 26 of them (13.3%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.770$ and there was no difference of unmet need of Family Planning between the respondents with low knowledge and the respondents with high knowledge, so knowledge had no effect on unmet need of Family Planning.

Table 2. Bivariate Analysis

Variable	Unmet Need of Family Planning				Total		OR (95% CI)	P Value
	Unmet Need		Met Need		N	%		
	n	%	n	%				
Age								
≥ 37.78 years old	41	22.5	141	77.5	182	100	6.397	0.000
< 37.78 years old	7	4.3	154	95.7	161	100	(2.780-14.722)	
Marital Status								
Married	48	14.1	293	85.9	341	100	0.859	1.000
Living together with partner	0	0	2	100.0	2	100	(0.823-0.897)	
Family Income								
Low	13	11.3	102	88.7	115	100	-	0.438
Middle	30	16.2	155	83.8	185	100		
High	5	11.6	38	88.4	43	100		
Residential Area								
Village	23	11.7	174	88.3	197	100	0.640	0.200
City	25	17.1	121	82.9	146	100	(0.347-1.180)	
Knowledge								
Low, < Mean 7.10	22	15.0	125	85.0	147	100	1.151	0.770
High, \geq Mean 7.10	26	13.3	170	86.7	196	100	(0.623-2.124)	

Table 3. Multivariate Analysis of Multiple Logistic Regression

No.	Variable	P Value	OR	Change of OR
I	1. Knowledge	-	-	-
	2. Age	0.000	6.369	-0%
	3. Residential area	0.183	0.650	0.1%
II	1. Residential area	-	-	-
	2. Age	0.000	6.397	-0.4%

Table 3 shows that the variable firstly excluded was the variable of knowledge because the variable of knowledge had the highest value of p among the other variables (value of $p > 0.05$). After the variable of knowledge was excluded, it turned out that the change of OR $< 10\%$. Therefore, the variable of knowledge was excluded forever from the model. The modeling of the second stage excluded the variable of residential area because the variable of residential area had the highest value of p . After the variable of residential area was excluded from the model, it turned out that the change of OR $< 10\%$. Therefore, the variable of residential area was excluded forever from the model. After the analysis by excluding the variable with value of $p > 0.05$ one by one, it obtained a variable with value of $p < 0.05$, namely age, so the final modeling of multivariate was obtained as the following.

The result of multivariate analysis obtained that the variable affecting unmet need of Family Planning on women of childbearing age in Banten Province in 2019 was age. OR of age was 6.397, it means that women of childbearing age ≥ 37.78 years old had a chance of unmet need of Family Planning 6.3 times as much as women of childbearing age < 37.78 years old. Based on the final result of multivariate analysis, it was found that the factor most dominantly correlating to unmet need of Family Planning on women of childbearing age in Banten Province in 2019 was age with the highest value of OR 6.397.

Unmet need of Family Planning on women of childbearing age in Banten Province in 2019 was 48 (14.0%). The result of the study was higher than the result of national SKAP survey in 2019 in where the unmet need of Family Planning was 12.1%; so the result of the study could not achieve the target of Strategic Plan 2015-2019, i.e. 9.91%. The result of the study was also higher than the result of showing that married women with unmet need of Family Planning were 11%. The study by Khalil et al. (2018) in Abha, Aseer Region in Saudi Arabia, showed that the prevalence of unmet need of Family Planning was 32.6%. The main reason of not using contraception were inaccessible Family Planning methods (68.0%), lack of knowledge (59.5%), religious belief (49.6%),

fear of side effects of contraception experienced in the past and opposing husbands (42.7%). The result of Demography and Health Survey in 52 countries between in 2005 and 2014 revealed the most common reason why married women avoided pregnancy, 26% of the women stated their fear of side effects of contraception and health risk; 24% stated that they rarely had sex or not at all; 23% stated that they or people close to them opposed contraception; and 20% stated that they were breastfeeding and/or did not have their period after giving birth yet (Sedgh et al., 2016).

According to BKKBN, (2018), unmet need of Family Planning was the percentage of married women who did not want any more children or wanted to restrict the number of next childbirths but did not use contraception. There were some reasons for not using Family Planning methods, among others were fertility including premenopausal and hysterectomy, desire to have many children, side effects of contraception used, and fear of side effects (Worku et al., 2019). For men, the reasons for not using Family Planning were related to fertility and related to Family Planning methods. Other reasons included the respondents who opposed the use of contraception (the individuals refused, husbands refused, other people refused, religious prohibition), lack of knowledge (Family Planning methods, source), far distance from place of service, expensive price of contraception, and discomfort (Kabagenyi et al., 2014; Kassa et al., 2014).

The concept of unmet need of Family Planning referred to fertile women (fecund) of age 15-49 who were married and wanted to postpone having children or wanted to restrict the number of childbirths (did not want any more children), but did not use contraception method (Bradley & Casterline, 2014; Misnaniarti & Ayuningtyas, 2016). In addition, pregnant women or women who just gave birth, if the pregnancy was unwanted or they actually did not want any more children, were included in the category of unmet need of Family Planning. The great level of unmet need of Family Planning not only would become the cause of population explosion, but also would affect the great number of maternal deaths in Indonesia, since it was one of the causing

factors of 75% of maternal deaths in Indonesia and in the world. Women of reproductive age who did not use Family Planning had a great chance of getting pregnant and suffering from complication during pregnancy, delivery, and childbirth. It could be caused by abortion due to unwanted pregnancy, close pregnancy interval, giving birth too many times, or complication of disease during pregnancy, complication during delivery, and complication during childbirth (Bongaarts, 2014).

Among the respondents of age ≥ 37.78 years old, 41 of them (22.5%) had unmet need of Family Planning, while among the respondents of age < 37.78 years old, 7 of them (4.3%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.000$, so age had effect on unmet need of Family Planning on women of childbearing age. The result of multivariate analysis obtained that the variable affecting unmet need of Family Planning on women of childbearing age in Banten Province in 2019 was age. Age was the variable most dominantly affecting unmet need of Family Planning on women of childbearing age. OR of age was 6.397, it means that the women of childbearing age ≥ 37.78 years old had a chance of unmet need of Family Planning 6.3 times as much as the women of childbearing age < 37.78 years old. The result of the study is in line with the study conducted by Zulkhijriani et al, On the sociodemographic characteristics of age, education and number of children significantly associated with the unmet need ($p = 0.000$) (Zulkhijriani et al., 2020).

The highest percentage of married women with unmet need of Family Planning was in the group of age 45-49 years old (14%). The greatest number of unmet need of Family Planning was found in the respondents of age > 35 years old. After interview, based on the result of the study, it was found that the reasons why they did not use contraception were because the thought that their age was not reproductive anymore and they thought that they were too old, so there was only a small chance of getting pregnant. Women's age affected the aspect of experience psychologically and physiologically in using contraception and it did not only affect women's motivation to control their fertility. The development of mistaken assumption

about fertility, namely the older age of someone, the lower chance for her for getting pregnant, was in line with the argument stating that the occurrence of unmet need of Family Planning was caused by a mistaken perception on the ability to get pregnant. The perception of the respondents that the age > 35 years old was the period when women's reproductive age stopped was mistaken, but actually during the age pregnancy could happen, the age where women could reproduce was 15-49 years old (Sahasrabuddhe et al., 2018). Age was one of the factors affecting someone's behavior including when they determined their choice to use contraception. It is in line with stating that the people's assumption that women of age > 35 years old were too old and there was only a small chance of getting pregnant had effect on unmet need of Family Planning (Harlow et al., 2017). There was a tendency that the older age of women and the more parity, the lower level of use of contraception. Older age did not seem to cause women to be more viable to use contraception. It was because the older the women, the closer they were to menopause. Therefore, women felt that they did not need contraception. In addition, the older age of women, the lower level of education received due to the effect of the era, the more difficult for them to accept new knowledge, including the knowledge about Family Planning.

Among the married respondents, 48 of them (14.1%) had unmet need of Family Planning, while among the respondents who lived together with their partners, 0 of them (0%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 1.000$, so marital status had no effect on unmet need of Family Planning. According to Asif research, in Pakistan marital status was not only defined as valid marriage by law (custom, religion, state, and so on), but also those who lived together and considered husband and wife by local people (Asif & Pervaiz, 2019). Married status means women of childbearing age bound by marriage, through government institution (valid by law) or in religious way or custom way; either living together with or separately from the spouse; while living together with partner means women of childbearing age lived together with partner as husband and wife

without registered in civil registry and religion. The result of the study is not in line with the study conducted by Oginni et al. (2015), in Nigeria showing that there was a significant correlation between marital status and unmet need of Family Planning ($p < 0.05$).

Among the respondents with low family income, 13 of them (11.3%) had unmet need of Family Planning, among the respondents with middle family income, 30 of them (16.2%) had unmet need of Family Planning, and among the respondents with high family income, 5 of them (11.6%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.438$, so family income had no effect on unmet need of Family Planning. The study by Hailemariam in Ethiopia showed that there was difference based on economic access in meeting the need of contraception. Women who had economic obstacle had risk to have unmet need of Family Planning than women who did not have economic obstacle. Economic access became a significant predictor on someone's status of unmet need of Family Planning. The result of other studies also stated that economic factor was included into the factors affecting someone in selecting contraception besides work status and affordable contraception service. It happened because people needed to provide fund to obtain contraception service. Although there was free contraception service, it required costs in form of transport supported by no economic activities of household. Income included someone's wage, salary, reward received upon activity or work done that if the salary, reward, or income in the family is sufficient to meet someone's basic needs, the needs will increase in accordance with the level of income obtained so there might be changes of basic needs, clothes, food, house, and other needs (Sedgh et al., 2016). Husband's income mostly affects the pattern of activities and mindset, including the chance to utilize the potential and facility available to meet the life needs. The data on consumption expense were used as an approach to measure the distribution of community income, although it was recognized that there were many weaknesses because it could give underestimated income (Khalil et al., 2018).

Among the respondents who lived in

village, 23 of them (11.7%) had unmet need of Family Planning, while among the respondents who in city, 25 of them (17.1%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.200$, so residential area had no effect on unmet need of Family Planning. The result of the study was different from the study conducted by Nzokirishaka & Itua, (2018), in Burundi showing that there was a correlation between residential area of village and city and unmet need. It did not conform to the statement of Silumbwe et al. that the distance of Family Planning service and residence affected unmet need of Family Planning. Residence that was far from Family Planning service could increase the obstacle affecting Family Planning participation on Family Planning acceptors (Paulus & Lette, 2019). Public perception on Family Planning program mostly did not support because of living in the village. Inviting them to participate in Family Planning program, it means inviting them to leave their old norms. The old values are the assumptions that children are old-age benefits, especially in agrarian community, more children more beneficial for the family in providing workforce in agricultural field; the position of sons as the successors is still dominant, because not having sons in certain communities means breakup with community (Silumbwe et al., 2018).

Among the respondents with low knowledge $< \text{mean } 7.10$, 22 of them (15.0%) had unmet need of Family Planning while among the respondents with high knowledge $\geq \text{mean } 7.10$, 26 of them (13.3%) had unmet need of Family Planning. The result of Chi-Square statistic test obtained value of $p = 0.770$, so knowledge had no effect on unmet need of Family Planning. The result of the study is not in line with the study by Bhusal et al. in Nepal showing that there was significant correlation between women knowledge and unmet need of Family Planning (value of $p = 0.04$). However, it is support the study by Bongaarts et al. that showing there was a correlation between knowledge about Family Planning and unmet need of Family Planning where the factor of knowledge about Family Planning was the most influential factor on unmet need of Family Planning on women of childbearing

age (Bongaarts & Bruce, 1995). The study by (Chafu, 2014) in Misha Region, South Ethiopia, showed that knowledge about contraception methods had positive correlation with unmet need.

Based on the respondents' knowledge about contraception methods, it was found that the number of respondents who knew about pill contraception method was 321 respondents (99.7%) and the number of respondents who knew about intravaginal/diaphragm contraception method was 15 respondents (4.7%). It is in line with the statement of Misnaniarti et. Al. that knowledge about Family Planning methods was common in Indonesia. 90% of women knew at least a type of contraception methods, while almost 100% of married women knew at least a type of the contraception methods. However, 96% of unmarried women knew at least a type of the contraception methods (Misnaniarti & Ayuningtyas, 2016).

Activities of communication, information, and education about Family Planning in Indonesia were socialization and information through various media. Media had an important role in socializing about Family Planning. Information about media exposure was important for program planner to determine effective target population in implementation of communication, information, and education about Family Planning, both mass media and outdoor media. Mass media are the media that could reach wide community, including television, radio, internet, and newspaper/magazine. Outdoor media can reach less than mass media. Outdoor media include pamphlet, leaflet/brochure, flipchart, poster, banner, billboard, exhibition, mobile Family Planning service, and so on. Contact with field officers of Family Planning and other health personnel, as well as teachers, religious figures, public figures, doctors, midwives/nurses, village apparatus, and PPKBD/Sub-PPKBD also played a great role in distribution of information and socialization about Family Planning program.

Conclusion

The factor dominantly affecting unmet need of Family Planning was age. OR of age was 6.397, meaning that women of childbearing age

≥37.78 years old had a chance of unmet need of Family Planning 6.3 times as much as women of childbearing age <37.78 years old. BKKBN was expected to keep making efforts to attract Family Planning participants by increasing the quality of Family Planning Counseling and Field Officers of Family Planning as well as Family Planning service especially in Banten Province.

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Community Participation in Non-communicable Disease Integrated Counselling Unit

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Abstract

This study discusses the internal factors of non-communicable disease integrated counseling unit (NCD Posbindu) implementation with community participation in NCD Posbindu village districts Wirobrajan, Yogyakarta. The design of this study was a cross-sectional study with a population of 58 people. Sampling using purposive sampling technique obtained 46 people. Bivariate data analysis uses the Kendall Tau test. The study notes a relation of knowledge to community participation with the results of significant value P-value of $0.002 < 0.05$. The Perceptions related to community participation get a significant P-value of $0.001 < 0.05$. The motivation was related to community participation with a significant P-value of $0.000 < 0.05$. Multivariate data analysis uses simple linear regression. The study notes that from 46 samples, F value $> F$ table ($10.599 > 2.83$). There is the influence of knowledge, perception, and motivation towards the NCD Posbindu implementation by community participation. The independent variables where the dominant influence is motivated by the largest value of Standardized Beta Coefficient is equal to 0.362.

Introduction

Non-communicable diseases (NCD) are the biggest killer, causing more than 60% of global deaths. A study estimates 60% of global deaths and 80% of all deaths in developing countries are due to non-communicable diseases (NCD), and cardiovascular disease (CVD) is responsible for half of. World Health Organization Global Status Report (WHO) 2010 on Non-Communicable Diseases reports a worldwide epidemic of cardiovascular disease (CVD), cancer, diabetes, and chronic respiratory disease, along with risk factors and their determinants. The report highlights the dominant global burden of this disease (Shilton et al., 2013). WHO data showed that 57 million (63%) of the world's deaths and 36 million (43%) of morbidity are caused by Non-communicable diseases (NCD). Global status report on NCD World Health Organization (WHO) in 2010 reported that 60% of death of all ages in the world was due to NCD. 4% of

them died before the age of 70 years old. All deaths that caused by NCD occurred in people aged less than 60 years old 29% happened in developing countries, while 13% happened in developed countries (Remais, 2012)

The results of Basic Health Research (Riskesmas) in 2007 and Household Health Survey (SKRT) in 1995 and 2001, it appeared that for 12 years (1995-2007) there had been an epidemiological transition showing that deaths from non-communicable diseases were increasing, while deaths from infectious diseases drop. It was predicted to continue. Non-communicable diseases (NCD) are experiencing increasing morbidity and mortality worldwide. Continuous advocacy, carried out by a skilled workforce, is needed (Shilton et al., 2013).

High-income countries have Initiatives to control cardiovascular disease (CVD) (Laya et al., 2019) and have had some success in reducing CVD prevalence in low and middle-

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income countries, only a few studies that have controlled for CVD and The prevalence of CVD continues to increase (Gupta et al., 2012). Compared with the CVD control program in low and middle-income countries to focus primarily on secondary prevention, programs in high-income countries are more comprehensive and focused on primary and secondary prevention. Programs in high-income countries focus on primary prevention to reduce risk factors for CVD through increasing awareness of a healthy lifestyle, and secondary prevention through early detection, and treatment improvement (Nissinen A, 2001).

One of the strategies for controlling non-communicable diseases that is efficient and effective is through empowerment and increasing community participation. Posyandu or Elderly Posbindu is for the benefit of the community. So the community should be able to play an active role in the formation, organization, utilization, and development of Posbindu as well as possible. The Posyandu formation must be maintained by carrying out good maintenance, for example by conducting regular regeneration (Shilton et al., 2013).

Community participation/community-based programs are effective in the primary risk factors control for Non-communicable diseases (NCD) and contribute significantly to global health. Posbindu is held for the benefit of the community so that the community should be able to be active in formation, organizing, utilizing, and developing the Posbindu as well as possible. Posyandu must be maintained by carrying out good maintenance, for example, by conducting regular regeneration (Shilton et al., 2013). As community participation, the Posbindu program launched by the government through the Ministry of Health to be implemented in Puskesmas. Several puskesmas have met the needs of Posbindu and several regulations, but there must be other efforts, such as regular training for those in the field, and clear guidelines for maintaining the sustainability of the program (Tetra-Dewi et al., 2013; Krishnan et al., 2011; Khan et al., 2015).

The main problem of NCD Posbindu is that the main target is not fully covered (healthy and at-risk community groups and people with NCD aged 15 and over). The Posbindu participants are dominated by people aged 45 and over. It indicates the lack of community participation and self-awareness, in the prevention and early discovery of NCD risk factors. The participants of NCD Posbindu are dominated by females. The program in DIY only started in January 2015, so the reporting system is still not maximal. Kelurahan Wirobrajan in Yogyakarta conducted an NCD Posbindu activity followed by 58 participants and found the attendance data was still low that was 42.67% (Note of NCD Posbindu village districts, Yogyakarta. This paper aimed to determine the relations between internal factors of NCD Posbindu implementation, community participation, and to find out the knowledge of the community about the NCD Posbindu implementation, community perceptions in following NCD Posbindu, and community motivation about the NCD Posbindu implementation.

This study was quantitative research with a descriptive survey analysis design. The data collection technique was by a cross-sectional approach. The population referred to in this research was the participants of NCD Posbindu registered in NCD Posbindu village districts Wirobrajan, Yogyakarta in 1 year (the data of 2015) that was 58 people. The sampling method used was purposive sampling technique with consideration: members of NCD Posbindu who still reside in RW 10 and want to be a respondent, so the sample was 46 people. This research took time from March 14 to April 4, 2016. It took place in village districts Wirobrajan, Yogyakarta. The data collection technique used in this study was a questionnaire that included the characteristics of respondents (name, age, gender, religion, last education, and occupation), and questions related to knowledge, perception, motivation, and community participation. The research instrument to collect the data in this research was a questionnaire. Knowledge was the

understanding of members of NCD Posbindu about NCD Posbindu. The indicators of the Knowledge in this research included the Understanding of NCD Posbindu, the Target of NCD Posbindu, the Activities and Implementation NCD Posbindu, the Implementer of NCD Posbindu.

The perception was the view of NCD Posbindu members about the real implementation of NCD Posbindu. The indicators of Perceptions in this study included Observation of NCD Posbindu, Implementation of NCD Posbindu, and Member Participation in NCD Posbindu. The motivation was the desire of NCD Posbindu members to follow the NCD Posbindu activity. The Motivation indicators in this research included Encouragement from cadres, officers, family, and other Posbindu members, and self-Encouragement. Community Participation was the active participation of NCD Posbindu members in the NCD Posbindu activity. Participation was defined as active when the attendance was ≥ 8 times in 1 year, and it was defined as inactive when the attendance was < 8 times in 1 year.

The data processing in this research was Editing, Coding, Processing, and Cleaning. The data analysis methods used univariate analysis to explain, in particular, frequency distribution and percentage of the variables of knowledge, perception, motivation, and community participation. Bivariate analysis using the Kendall tau formula. The significance test of the correlation coefficient used the formula Z because the distribution was close to normal. Multivariate analysis used the F test. All data processing uses the version "SPSS 16.0 for Windows.

Result and Discussion

NCD Posbindu was established in village districts Wirobrajan, Yogyakarta. This NCD Posbindu was formerly Elderly Posyandu (an integrated health service post), transformed into NCD Posbindu. Therefore, it was expected that not only the elderly but also pre-elderly individuals participated in the examination in NCD Posbindu because NCD Posbindu was also intended for those aged 15 years

and over. The NCD Posbindu's activity was a program of Puskesmas Wirobrajan whose activities involved the participation of the elderly, families, community leaders, and social organizations. NCD Posbindu was held every month.

The objective of NCD Posbindu activity was to increase community participation in the prevention and early discovery of NCD risk factors. The major groups of NCD are Diabetes Mellitus, Cancer, Heart and Blood Vessels Disease, Chronic Obstructive Pulmonary Disease (COPD), and Crash and Violence Disorders. The activity of NCD Posbindu was conducted with five stages. Each stage was tailored to five tables. Each table had its roles and functions. Table 1: Registration, the cadre gave the same code number in KMS FR-NCD and the Book of Records. Table 2: Interview (Filling KMS FR-NCD) by the cadre. Table 3: Measurement of NCD Risk Factors. Table 4: Counselling services (Personal counseling) by the cadre. Table 5: Filling KMS FR-NCD, Handing KMS back to the Participant, recording in the book of NCD Posbindu Activity Result and Follow-Up Information. The results of all these activities were still recorded in a ledger and recorded in KMS.

Table 1 shows that the most dominant respondents by age were between 60-71 years old, with 19 respondents (41.3 %). The characteristics based on the most dominant sex was female, which was 35 respondents (76%). Respondent categories provide an overview related to age, gender, education, and occupation of the respondent, all of which affect the participation of the elderly in a visit to NCD Posbindu. It follows the results of research from Wayuni et al (2016), stating the elderly participation in health coaching activities, gender, occupation, attitudes, needs, and family support. Based on education, most respondents were primary school graduates, which were 18 people (39.1%). Based on the work, most respondents were housewives, namely 22 people (47.82%). The characteristics of research respondents can be seen in the following table:

Table 1. Overview of Respondents by Individual Characteristics

The Characteristics	n= 46	%
Age (years)		
48-59	16	34.8
60-71	19	41.3
72-83	11	23.9
Gender		
Male	11	24.0
Female	35	76.0
Level of Education		
Primary school	18	39.1
Junior High school	10	21.7
Senior High School	9	19.6
College	9	19.6
Occupation Employment Status		
Labor	2	4.3
Trader	13	28.4
Retirees	4	8.7
Private companies	2	4.3
Civil Servants	22	47.8
Non Employment Status/ Housewives		

Source : Primary Data, 2016

The characteristics of the respondents in Table 1 are following the research results of Sudharma et al (2016), that the majority of respondents are female, have junior high school education (from not in school to junior high school), and 55.8% of them do not work (non-employment status). However, most of the respondents are <45 years old (76.7%)

The conclusion from the research of Hoebel et al (2017), is that socio-economic inequality in the health sector occurs at older working age and early retirement but can narrow at an older age, especially in men. Seniors who are socially disadvantaged experience higher barriers to accessing health services than those who are wealthier. Socio-economic status (SES) is measured based on education, (former) employment, and income. The Socio-economic conditions and psychosocial factors that occur in middle age impact on health opportunities in old age thus contributing to health inequality in the elderly (Fors et al., 2012).

Posbindu in this study is mostly used by groups having lower education than secondary level. This fact contradicts the theory that the higher the level of local education, the higher the possibility of running a public health facility. Fors (2012), in their study showed that women with secondary or higher education were

almost 1.8 times more likely to seek treatment from a doctor/nurse to treat their antepartum morbidity. But in their prospective study did not find a significant association between education level and health service utilization after hypertension screening, although there was a slight decrease in quality with increasing their level of education (Fors et al., 2012).

Based on Table 2, Knowledge: 41.30% (19 respondents) of respondents had less knowledge. "Knowledge" in this study meant the members understanding about NCD Posbindu; Community perception: 41.30% (19 respondents) of respondents had less perception; Community motivation: 36.96% (17 respondents) of respondents were less motivated. On Community participation in NCD Posbindu village districts Wirobrajan, Yogyakarta, 82.61% (38 respondents) had inactive participation. The inactive participation of the elderly is following the results of observations from Laya (2019), reviewing the existing literature on perceptions, knowledge, and use of elderly services as follows: in general, the elderly are aware of the importance of health services, the level of service utilization is too low, and the use of services carried out by good. Other than that, Only as much as 25 % of the elderly use Posbindu service in Indonesia (Sudharma et al., 2016). Several obstacles encountered in the Posbindu program required all parties to pay attention to health service providers to maintain its continuity. Most of the elderly do not come to Posbindu because they feel unimportant, feel healthy, and are more concerned with their job (Yandrizal et al., 2016)

The results Umayana & Cahyati (2015) , show that family support (p-value = 0.0001) and support from community leaders (p-value = 0.001) correlated with the activeness of the community who came to NCD Posbindu in Semarang City. According to the author, role of cadres also plays a role in increasing community participation in NCD Posbindu is in line with the results (Krubiner et al., 2016), stating woman empowerment and global health promotion are the main goals of the development. Likewise, the results of Gupta et al (2012), state the program called "Public Health Workers" as community health workers in the treated village required behavioral change

to prevent disease. Several studies have shown that ability to do daily routines is a predictor of quality of life (Wongsawat, 2017). Quality of life is affected by the physical, psychological, level of independence, and individual relationships with the environment (Alexandre et al., 2009). The living environment is a vital factor affecting the quality of life of the elderly (Zubritsky et al., 2013).

Social contact plays a vital role in determining an individual's health behavior which must be considered alongside other factors. (Drageset, 2004). According to (Laya, 2019), parents of retired Chinese migrants, interacting with friends is their primary form of social bonding when community sports are the main way they feel involved with their community. The results of the study of the elderly (≥ 65 years) without cognitive impairment showed that successful aging was more likely to occur in those who were able to visit relatives and friends (OR: 3.86, 95% CI: 1.09-13.61) (Li et al., 2014). In Indonesia, one form of interaction with fellow elderly is regularly participating in activities at the Elderly Posyandu. Although social interactions that encourage the elderly to be active are also reduced, it can affect the quality of life of the elderly (Sovariova, 2016). Fors (2012), has suggested that direct contact between younger and older persons could cause younger to develop more positive attitudes toward the elderly. However, several studies Fors et al (2012) have found that the amount and frequency of direct contact with the elderly were not associated with the development of more positive attitudes toward the elderly.

Based on Table 2, the Kendall Tau statistical test between knowledge and participation Sig. value = 0.002. It shows statistical significance. Kendall Tau test value ($r = 0.435$) indicates that H_a is accepted. It means there is a relationship between Knowledge about NCD Posbindu and Community Participation. The results of this study are per the results of Sudharma et al (2016), research founding a significant relationship between the knowledge variable and the use of Posbindu (OR = 3.82; 95% confidence interval 1.60-9.09). In contrast to the results of Yandrizal (2016), on Knowledge and Desire to Come to Posbindu. The statistical

analysis test showed a p-value of $0.408 > 0.05$, indicating no relationship between knowledge and desire to come. People may not know about NCD Posbindu, so there is no desire to come.

The Kendall-Tau statistical test between perception and participation obtained Sig. p-value = 0.001. This showed that P-value was $0.001 < 0.05$ or 5%. It shows a statistically significant relationship between the Perception of NCD Posbindu and Community Participation. The test value of Kendall Tau ($r = 0,450$) meant that H_a was accepted (hypothesis accepted) and H_o was rejected (hypothesis rejected). This research is in line with Laya et al (2019), stated that the Interrelation Among Elderly Perception and Participation and The Utilization of Posyandu, which stated that perception was related to the use of posyandu for the elderly.

The Kendall-Tau statistical test between motivation and participation obtained Sig. p-value = 0.000. This showed that P-value was $0.000 < 0.05$ or 5%. It shows a statistically significant relationship between the Motivation of NCD Posbindu and Community Participation. The test value of Kendall Tau ($r = 0,520$) meant that H_a was accepted (hypothesis accepted) and H_o was rejected (hypothesis rejected). It is contrary to research conducted by Novianti (2018) which states that the motivation of the elderly has no relationship with the use of posyandu for the elderly.

Motivation plays a vital part in an elderly individual's ability to recover from a disabling event. On the other hand, apathy is a lack of motivation (Resnick, 2012). Apathy, or loss of motivation, is the most common behavior change but is not realized by the elderly (Laya, 2019). To increase motivation in the elderly, health workers need to develop interventions and help them reach and maintain the highest functional level (Resnick, 2012). The results of the study Sovariova (2016), show that motivation enhancement programs are effective for reducing cardiovascular risk and improving the institutionalized functional status of the elderly by motivating them to perform better health behaviors. Table of variable bivariate analysis is as follows:

Table 2. Bivariate Analysis of Community Participation In *Posbindu* Non-Communicable Diseases

Variable	Community Participation n= 46			KoefisienKendall's tau_b (r)	P-value
	Inactive	Active			
Knowledge					
Good	4(8.7%)	6(13.0%)	10 (21.7%)	.435	.002
Enough	16(34.8%)	1(2.2%)	17 (37.0%)		
Less	18(39.1%)	1(2.2%)	19 (41.3%)		
Perception					
Good	10(21.7%)	7(15.2%)	17 (37.0%)	.450	.001
Enough	9(19.6%)	1(2.2 %)	10 (21.7%)		
Less	19 (41.3%)	0(0 %)	19 (41.3%)		
Motivation					
Good	8(17.4%)	8(17.4%)	16 (34.8%)	.520	.000
Enough	13(28.3%)	0(0 %)	13 (28.3 %)		
Less	17(37.0%)	0(0 %)	17 (36.9 %)		

Source : Primary Data, 2016

A multivariate test was conducted to determine the influence of knowledge, perception, and motivation factors on the implementation of NCD *Posbindu* and community participation

in NCD *Posbindu* village district Wirobrajan, Yogyakarta Year 2016. Based on the multiple linear regression analysis in table 3.

Table 3. Multiple Linier Regression of Community Participation In *Posbindu* Non-Communicable Diseases

Variable	Regression Co-efficient	t-value	Standardized Coefficient Beta	Sig.	F-value	R ²	sign
Knowledge	0,138	2,148	0,280	0,038	10.599	.431	.00
Perseption	0,084	1,433	0,196	0,159			
Motivation	0,162	2,690	0,362	0,010			

Source: Primary Data, 2016

The result of the F-test obtained the F-value of 10,599 with a significance of 0,000. The value of F table with dk1 = 3, dk2 = 42 at significance level $\alpha = 0.05$ was 2.83. Therefore, the value of F-value > F-table meant that H_a was accepted. It meant that the variables of knowledge, perception, and motivation, altogether, affect the variables of community participation. The coefficient of determinant R square showed number 0,431. It meant that the independent variables (knowledge, perception, and motivation) contribute 43.10 % to community participation. 56.90 % were affected by other factors not examined. To find out which independent variable had the most dominant effect on the dependent variable is by Standardized Coefficient Beta Test. The independent variable dominantly affects the dependent variable was tested by the highest Standardized Coefficient Beta. By looking at the result of the Standardized Coefficient Beta

from each independent variable (knowledge, perception, and motivation) in the table, it could be seen that the independent variable that had a dominant influence on the dependent variable of public participation was motivation. The value of Standardized Coefficient Beta for motivation was higher than the other independent variables, which was 0.362.

Conclusion

The conclusions obtained from this research are as follows: First, there is a relationship between knowledge and community participation in *Posbindu* village districts Wirobrajan, Yogyakarta. Second, there is a relationship between perception and community participation. Third, there is a relationship between motivation and community participation. Fourth, knowledge, perception, and motivation altogether affect the community participation variable. The

independent variable that has the most dominant influence on the dependent variable of community participation is the independent variable of motivation.

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Association between Maternal Mental Health and Child Stunting in Indonesia

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Abstract

This study aims to study maternal mental health's association to stunting in children under five years old in Indonesia, which is related to mothers, children, and households' characteristics based on the age group of children under five years old. This study uses longitudinal data from the Indonesian Family Life Survey (IFLS) in 2007 and 2014 with the Logistic Regression method. Maternal mental health was measured using the CESD-10 instrument. The results showed that in the children's age group of 0-59 months and 24-59 months, an increase in the total CESD-10 score was associated with stunting in children after being controlled by all the characteristics. At age 0-23 months, the increase in the total score of CESD-10 was not associated with stunting. Maternal height, breastfeeding duration, child age, birth weight, and residence location were associated with stunting in all age groups. Maternal education and expenditure quintiles were associated with stunting in the 0-59 months and 24-59 months age groups. Meanwhile, two variables only relate to the incidence of stunting in one age group of children under five, namely maternal age (0-59 months of children under five) and sanitary conditions (24-59 months of children under five).

Introduction

Based on data from Riset Kesehatan Dasar (Riskesdas) in 2018, the prevalence of stunting in children under five in Indonesia is still high. If observed according to the nutritional status prevalence threshold according to WHO (2017), in addition to underweight who are at moderate prevalence, both stunting and wasting are still in the high and severe prevalence category (Fig.

1). Stunting is a serious health problem in child development characterized by height for age below -2 standard deviations. Stunting children will have poor quality health and cognitive abilities, resulting in low productivity and wages when adults (De Onis & Branca, 2016; Pacheco et al., 2017). Therefore, stunting can inhibit economic growth, increase inequality, and poverty in a region (Allen, 2014).

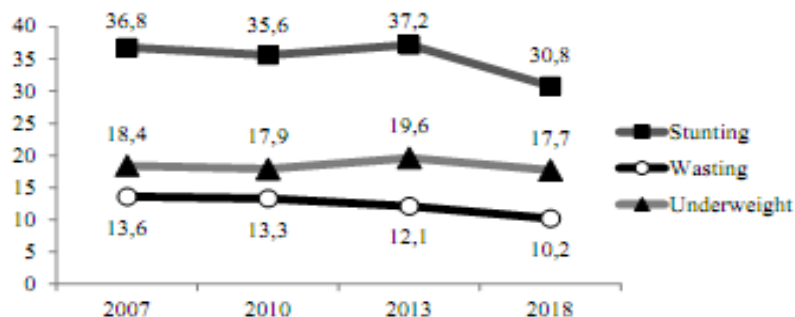


Figure 1. Prevalence of Stunting, Wasting and Underweight Children in Indonesia 2007-2018 (Kementerian Kesehatan RI)

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Several studies suggest that maternal mental health is associated with child nutrition, especially in the Asian region (Nguyen et al., 2014; Surkan et al., 2008; Upadhyay & Srivastava, 2016). Mental disorders are one of the health problems in many countries. It is estimated that 322 million people worldwide suffered from depression in 2015, and nearly half (48 percent) were in the Asia Pacific region. According to gender, most people with depression are women (Steel et al., 2014; WHO, 2017). Based on Riskesdas 2018, the prevalence of mental-emotional disorders in Indonesia among people aged 15 years and over was around 6 percent in 2013 and increased to 9.8 percent in 2018 (Kementerian Kesehatan RI, 2018). In terms of being the primary caregiver for children, mothers who experience maternal depression will be associated with their children's nutritional condition (Motlhatlhedhi et al., 2017). Children who experience low nutritional status, both underweight, stunting, and wasting, will increase the risk of morbidity and mortality (WHO, 2017).

The first thousand days of life (the golden period) or the period from when the fetus is still in the womb to after the birth of a human is essential. Pulungan et al., (2018) states that babies and early childhood are healthy and smart, starting from their mother's factors during pregnancy and the pre-pregnancy period to prepare for pregnancy correctly. Therefore, it is necessary to deal with health problems in early childhood.

Because, stunting impacts the individual level and at the community level. The benefit-cost ratio of each country varies but based on the research of Hoddinott et al. (2013), assuming that for every value of money invested in the stunting reduction program in Indonesia, estimated that 48 times the economic value return will be obtained.

Although research on the relationship between maternal mental health and stunting in children under five has been carried out in many countries, few studies link the two in Indonesia. Existing studies only focus on specific areas and population groups, not covering a wider area and population groups. Therefore, this study focuses on the relationship between maternal mental health and the incidence

of child stunting and reviews it according to catch-up age groups on under-five stunting in Indonesia. In this study, nutritional status was measured using anthropometric achievements of children under five according to the height according to age (height/age), then categorized according to WHO categorization. Mental health measurements were seen through an increase in the total score of CESD-10 between 2007 and 2014 using longitudinal data from the Indonesian Family Life Survey (IFLS). Therefore, this research aims to study maternal mental health's stunting relationship in children under five in Indonesia.

The linear growth since the beginning of life is the best indicator in determining welfare and an accurate marker in the boundaries of human development gaps (De Onis & Branca, 2016). Therefore nutrition at the beginning of life is essential for short-term and long-term investment (Martorell, 2017). Allen (2014) define health and nutrition through the household production function approach and its derivative forms. In their description, Behrman and Deolalikar revealed that a person's health and nutrition productivity starts from household-level consumption. In general, Indonesia's population is short (Pulungan et al., 2018; Sohn, 2015). However, short stature due to stunting is different from genetically short. Stunting in children is a chronic nutritional problem continuing (Scheffler et al., 2020; Tanjung et al., 2020). In addition to the direct impact experienced by children, stunting can be associated with the next generation's health, social, and economic conditions (De Onis & Branca, 2016).

Mental health can be affected by several socio-economic factors (Allen et al., 2014). Depression is one of the most common mental health problems. Approximately 30 to 50 percent of adults who experience depression tend to become chronic or recurring disorders in a cycle of ongoing stress. Management and family relationships become increasingly hard, and social costs increase (Allen, 2014). Depression is a mental disorder that is more common in women than in men (Douglas & Scott, 2014). Where the risk of depression increases in the perinatal period (Bauer et al., 2016).

In Upadhyay & Srivastava view (2016), a person's human capital (Human Capital) is related to the quality of increasing future income by increasing human resources by investing through education, health, and care since childhood. Therefore mental health and nutrition as part of the scope of health are aspects of human capital that are prerequisites for increasing productivity (Upadhyay & Srivastava, 2016). Weak mental health has been linked to impaired parent-child interaction, increasing the risk of mother-child relationships lacking enthusiasm and energy in raising children (Wemakor & Mensah, 2016).

Mothers who have mental health problems such as depression, apart from experiencing limitations themselves, impact their families, especially their children. From an economic perspective, maternal depression can be associated with decisions related to preferences, risks, business costs, and maternal aspirations to reduce human capital investment in children (Baranov et al., 2020). Besides, malnourished children are at risk of developing failure and are prone to infections and other health problems, resulting in reduced human capital. Children with limited human capital tend to be uncompetitive, resulting in decreased productivity and low wages (Victora et al., 2008).

Method

This study uses data from the 4th and 5th waves of the Indonesian Family Life Survey (IFLS). This study's analysis unit is a single child aged less than five years or 59 months who lives with a biological mother. In the next step, after removing a sample of children under five who did not have information about the variables needed in this study, 2,879 samples of under-fives were obtained, which could be analyzed. The dependent variable in this study is stunting status in children. In this study, the nutritional status used was the height index according to age (height/age), further categorized into two, namely standard/normal and stunting. This study's primary independent variable is the increase in the mother's CESD-10 score, used

to describe the mother's mental health. The increase in the CESD-10 score was observed through depression changes' scores in 2007 and 2014. The CESD is an independent measurement instrument designed by Wemakor & Mensah to measure depressive symptoms in a population. It is easy to use where respondents only answer a few question items in CESD without going through related health personnel (Wemakor & Mensah, 2016). In this study, the improvement in depressive symptoms was calculated by looking at the positive difference between the total CESD-10 score at two study time points.

In addition to the variable of maternal depression symptoms as the primary independent variable, this study also used other independent variables as control variables. This study's control variables were grouped according to mother, child, and household characteristics. Mother characteristics consisted of variables of mother's age, mother's education, mother's height, breastfeeding duration, exclusive breastfeeding, and birth spacing. The child's characteristics consisted of gender, birth weight, age of the child, and birth order. Household characteristics consist of household expenditure variables, sanitary conditions, and location of residence. In this study, the analysis was carried out by looking at the relationship between the independent variables and the child's stunting status using three approaches according to the age group of children under five. The first group is the child group aged 0-59 months, the second group is the child group aged 0-23 months, and the last group is the child group aged 24-59 months. This study uses the binary logistic regression method (Logit).

Result And Discussion

Table 1 shows that children under five who had a stunting condition in 2014 were 33.31. The proportion is almost the same in all age groups in more detail. In this study, all categories were dominated by the mother's condition, who experienced an increase in the CESD-10 score.

Table 1. The Distribution of the Samples Studied According to the Age Group Under Five

Variables	Total (n)	0-59 Months		0-23 Months		24-59 Months	
		Percentage (%)	Total (n)	Percentage (%)	Total (n)	Percentage (%)	Total (n)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stunting Status	Normal	1,920	66.69	726	66.73	1,194	66.67
	Stunting	959	33.31	362	33.27	597	33.33
Improved CESD-10 Score	0	1,161	40.33	470	43.20	691	38.58
	1-9	1,424	49.46	524	48.16	900	50.25
	≥ 10	294	10.21	94	8.64	200	11.17
Mother's Age	20-25 Years	322	11.18	171	15.72	151	8.43
	25-30 Years	787	27.34	301	27.67	486	27.14
	30-35 Years	954	33.14	353	32.44	601	33.56
	35-40 Years	592	20.56	209	19.21	383	21.38
	40-45 Years	188	6.53	49	4.50	139	7.76
	45+ Years	36	1.25	5	0.46	31	1.73
Mother's Education	Elementary Sch. & Below	745	25.88	254	23.35	491	27.41
	Junior High Sch.	723	25.11	265	24.36	458	25.57
	Senior High Sch. & Above	1,411	49.01	569	52.30	842	47.01
Mother's Height	< 145 cm	288	10.00	110	10.11	178	9.94
	≥ 145 cm	2,591	90.00	978	89.89	1,613	90.06
Duration of Breastfeeding	< 6 Months	636	22.09	353	32.44	283	15.80
	6-12 Months	392	13.62	291	26.75	101	5.64
	12-18 Months	459	15.94	241	22.15	218	12.17
	18-24 Months	532	18.48	203	18.66	329	18.37
	≥ 24 Months	860	29.87	-	-	860	48.02
Exclusive Breastfeeding	No	2,298	79.82	882	81.07	1,416	79.06
	Yes	581	20.18	206	18.93	375	20.94
Birth Spacing	0 Months	1,622	56.34	486	44.67	1,136	63.43
	1-33 Months	435	15.11	168	15.44	267	14.91
	≥ 33 Months	822	28.55	434	39.89	388	21.66
Gender	Female	1,378	47.86	508	46.69	870	48.58
	Male	1,501	52.14	580	53.31	921	51.42
Birth Weight	< 2,5 Kg	213	7.40	70	6.43	143	7.98
	≥ 2,5 Kg	2,666	92.60	1,018	93.57	1,648	92.02
Children's Age	0-12 Months	523	18.17	523	48.07	-	-
	12-24 Months	565	19.62	565	51.93	-	-
	24-36 Months	95	3.30	-	-	95	5.30
	36-48 Months	1,054	36.61	-	-	1,054	58.85
	48-60 Months	642	22.30	-	-	642	35.85
Birth Order	1	1,605	55.75	481	44.21	1,124	62.76
	2	875	30.39	416	38.24	459	25.63
	3	266	9.24	130	11.95	136	7.59
	4+	133	4.62	61	5.61	72	4.02
	Expenditure Quintile	Q1	556	19.31	194	17.83	362
Q2		581	20.18	224	20.59	357	19.93
Q3		550	19.10	202	18.57	348	19.43
Q4		580	20.15	231	21.23	349	19.49
Q5		612	21.26	237	21.78	375	20.94
Sanitation	Proper	667	23.17	246	22.61	421	23.51
	Not Proper	2,212	76.83	842	77.39	1,370	76.49
Location	Urban	1,741	60.47	666	61.21	1,075	60.02
	Rural	1,138	39.53	422	38.79	716	39.98
Primary Caregiver	Mother	2,702	93.85	1,019	93.66	1,683	93.97
	Father	24	0.83	7	0.64	17	0.95
	Grandparents	142	4.93	58	5.33	84	4.69
	Others	11	0.38	4	0.37	7	0.39

Source: IFLS 4 and IFLS 5, compiled

Although there is a suspicion of endogeneity in this study, due to the complicated relationship, this study only uses association analysis, not causality analysis. Therefore, in analyzing the relationship between the independent variables and the dependent variable, binary logistic regression is used to determine which variables are associated with children's stunting status. The inferential analysis is presented in Table 2. The logit model of the 0-59 month group of children shows that the variables proven to provide a positive and significant association are an increase in CESD-10 score, duration of breastfeeding, and residence location. Meanwhile, the variables that have proven to be negatively and significantly associated were maternal age, maternal education, maternal height, child age, birth weight, and expenditure quintile. This research shows that the increased risk of stunting in children aged 0-59 months is influenced by an increase in the CESD-10 score in mothers, younger maternal age, education of mothers who do not / have graduated from primary school when compared to mothers who have completed at least senior high school, shorter maternal posture, longer breastfeeding duration, younger age of children, LBW, lowest expenditure quintile compared to the highest quintile, and those living in rural areas.

For child group aged 0-23 months, although it can increase the risk of stunting, statistically, the variable CESD-10 score increase as the primary independent variable is not proven to be significant. In the logit model, the variables that proved to be statistically significant in a negative direction were the mother's height and the child's birth weight. Meanwhile, the positive association was indicated by the duration of breastfeeding, the child's age, and residence location. This result means that increasing mothers, adequate birth weight of children, shorter breastfeeding duration, increasing age, and living in urban areas can reduce the chances of children under five experiencing stunting.

In the child group aged 24-59 months, the variables that proved to be statistically significant in a negative direction were maternal

education and height, age and birth weight of children, and expenditure quintile. Meanwhile, the positive association was indicated by an increase in the CESD-10 score, duration of breastfeeding, and household residence location. This result means that the lower the increase in the mother's CESD-10 score, the higher the mother's height, the mother with minimum high school education, the increasing age of the child, sufficient birth weight of the child, the fifth expenditure quintile, shorter breastfeeding duration, and living in urban areas can reduce the chances of children under five experiencing stunting status.

Mothers who have chronic depressive symptoms can be associated with their health and significantly reduce the quality of their child's health (Vliegen et al., 2013). Besides, other evidence from previous research conducted by Girma et al. (2019), in Ethiopia and Wemakor & Mensah (2016), in Ghana stated that children who have mothers with episodic depression symptoms are at 2-3 times higher risk of experiencing stunting. Duarte et al. (2012), noted that maternal depression is related to eating difficulties or unhealthy feeding practices. Where mothers who experience depression tend to let their children eat alone so that for younger children, food fulfillment is disturbed, while older children are likely to eat alone without supervision.

If broken down according to the age group of children under five, this study shows that the increase in the CESD-10 score of the mother is not associated with the stunting status of children aged 0-23 months. Although these results contradict the research of Avan et al. (2010), in South Africa, which showed a relationship, these results are in line with the study of Kaaya et al. (2016), in Tanzania and Wemakor & Iddrisu (2018), in Ghana who states that maternal depression is not related to stunting status in the 0-23 month age group. This result is related to the complex nature of maternal depression and the potential association with infant nutritional status, which may vary according to the severity of a woman's depression and the level of support she may receive from family and the wider community.

Table 2. Summary of Estimated Output Parameters (β) and Odds Ratio (Exp (β)) Binary Logistic Regression in the Stunting Model by Age Group

Variables	Age Groups (Months)					
	0-59		0-23		24-59	
	β	Exp(β)	β	Exp(β)	β	Exp(β)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Maternal Mental Health	0,0260 ***	1,0263	0,0189	1,0191	0,0335 ***	1,0341
Mother's Age	-0,0146 **	0,9855	-0,0155	0,9846	-0,0110	0,9890
Mother's Education						
Elementary School and Below						
Junior High School	-0,1068	0,8987	-0,2300	0,7945	-0,0593	0,9424
Senior High School and Above	-0,2818 ***	0,7544	-0,1352	0,8735	-0,4244 ***	0,6541
Mother's Height	-0,0773 ***	0,9257	-0,0576 ***	0,9440	-0,0942 ***	0,9101
Duration of Breastfeeding	0,0322 ***	1,0328	0,0358 **	1,0365	0,0207 ***	1,0209
Exclusive Breastfeeding						
No						
Yes	-0,0543	0,9471	-0,2833	0,7533	-0,0222	0,9780
Birth Interval						
1-33 Months						
0 Months	-0,2156	0,8060	0,8646	2,3740	-0,7328	0,4806
≥ 33 Months	-0,1376	0,8714	-0,0469	0,9542	-0,1909	0,8262
Children's Age	-0,0071 **	0,9929	0,0473 ***	1,0485	-0,0165 ***	0,9836
Gender						
Female						
Male	0,1123	1,1188	0,1868	1,2054	0,0739	1,0767
Birth Weight						
< 2,5 Kg						
≥ 2,5 Kg	-0,8923 ***	0,4097	-0,7754 ***	0,4605	-0,9839 ***	0,3738
Birth Order						
1						
2	0,0702	1,0727	1,0191	2,7707	-0,3483	0,7059
3	-0,0019	0,9981	1,0573	2,8785	-0,4958	0,6091
4+	0,4891	1,6309	1,6087	4,9963	-0,0826	0,9208
Expenditure Quintile						
Q1						
Q2	-0,0260	0,9743	-0,0675	0,9347	0,0257	1,0261
Q3	-0,2014	0,8176	-0,0534	0,9480	-0,3086 *	0,7344
Q4	-0,0735	0,9291	0,1218	1,1295	-0,2338	0,7915
Q5	-0,2581 *	0,7725	-0,0143	0,9858	-0,3864 **	0,6795
Sanitation						
Proper						
Not Proper	-0,0497	0,9515	0,2548	1,2902	-0,2473 *	0,7809
Location						
Urban						
Rural	0,1882 **	1,2071	0,2542 *	1,2894	0,1886 *	1,2075
Primary Caregiver						
Mother						
Father	-0,0065	0,9935	0,4879	1,6290	-0,3298	0,7191
Grandparents	-0,1223	0,8848	0,0696	1,0721	-0,3989	0,6710
Others	-0,6526	0,5207	-0,6806	0,5063	-0,9610	0,3825

Source: IFLS 4 and IFLS 5, compiled

The research results in children aged 24-59 months showed that consistently increasing the mother's CESD-10 score could increase the child's risk of stunting. The increase in maternal CESD-10 score did not change even though other variables were included in the model. This result means that other variables do not limit the increase in the mother's CESD-10 score related to with under-five stunting. This result is in line with Claire et al., (2019) 's research in South Africa, which states that the increased risk of stunting is not solely due to the household's social or economic environment. The effects of a mother's depressive symptoms have a long-term impact on her child's health. This increase in the CESD-10 score will increase the chances of children becoming stunted. This reason may be due to the low positive influence of mothers, which harms children. This effect is related to the mother's age when having children under five. In this case, there are still quite a few mothers who give birth at a very young age, especially in the 24-59 month age group.

Shafieian et al. (2013), stated that maternal age is associated with the child's nutritional status. This result is related to the mother's increasing age, and it is assumed that there will be more experience and decision-making ability in providing nutrition to children (Richards et al., 2013). This statement is in line with the results for the child group aged 0-59 months. In the highest education, the results showed that mothers who completed at least high had a significant negative association with the child's stunting status. The higher the level of mother's education, the lower the tendency for children under five to experience stunting in the 0-59 months and 24-59 months age groups. Education is a crucial factor in improving childcare abilities. This state relates to the mother's ability to absorb information and apply it to childcare. Consistently, increasing the mother's height reduces the tendency for children to experience stunting without being limited by other variables. These results corroborate several previous studies by Upadhyay & Srivastava (2016), in India, Kim et al. (2017), in parts of South Asia, and Beal et al. (2018), in Indonesia, which state that the level of education and posture of the mother is directly proportional to the nutritional status of

children.

The duration of breastfeeding is significantly associated with stunting status in children. This state indicates that the longer the child is breastfed by the mother, the greater chance of being stunted. Although the effect was small, it was a little surprising. Pulungan (2018) , concluded that breastfeeding is related to the diversity of children's diets and welfare levels. Pulungan explained that households with a low welfare level usually carry out the long duration of breastfeeding. The longer the duration of breastfeeding tends to reduce the intake of solid food, resulting in insufficient nutrition for children. Child age consistently provides a negative and significant association with the incidence of under-five stunting. Although the effect is minimal, these results indicate that with increasing children's age, nutritional status can be improved (Pulungan, 2018). Consistent results are also shown by the children under five birth weight having a negative association in the three groups under five. Internal factors associated with stunting children in developed and developing countries come from low birth weight (Stewart, 2007). The child's low weight at birth can increase the risk of morbidity and mortality, and it is an indicator of maternal health, the nutritional status of children, and household welfare (Cutland et al., 2017; Simbolon et al., 2019).

Regarding household characteristics, the expenditure quintile shows that a higher expenditure has a greater chance of reducing stunting status for children under five. The expenditure quintile approach illustrates this household income. Apart from reporting bias, household expenditures can describe the condition of welfare in the long term (Wemakor & Mensah, 2016). The higher the income, the more varied the choices in food consumption, access to health facilities, so that the risk of infection decreases and sanitation condition becomes better, which has an impact on increased nutritional status. In both developed and developing countries, family income will be associated with children's health conditions (Beal et al., 2018; Shafieian et al., 2013; Stewart, 2007). Also, the group of children aged 24-59 months with proper sanitation conditions or having a lavatory equipped with a septic tank

has a lower risk of stunting. A clean and healthy environment supports children's growth and development for the better, especially when older children are integrated into their territory. This result is related to adequate space and sanitary conditions. Latrines or disposal sites that are not up to standard, dirty environments, can cause various disease problems, increasing the risk of children experiencing low nutritional status (Beal et al., 2018; Danaei et al., 2016; Ricci et al., 2018; Upadhyay & Srivastava, 2016). Research conducted by Pulungan (2018), in Indonesia found that children who are at risk of experiencing stunting come from households with inadequate sanitary conditions. Children who live in rural areas tend to have a higher association of stunting than children living in urban areas. These results are in line with the research results of Jayachandran & Pande (2017), Kanjilal et al. (2010), and Upadhyay & Srivastava (2016). This state is related to the environment's culture (Wolfe & Behrman, 1982). Culture is associated with different child care and feeding patterns between rural and urban areas (Abuya et al., 2012; Jayachandran & Pande, 2017; Kanjilal et al., 2010).

Conclusion

The majority of mothers experiencing depression symptoms in 2007 increased in 2014 in line with the mother's advancing age. The increase in mothers' CESD-10 score significantly increased the risk of children under five experiencing stunting, especially in the 0-59 months and 24-59 months age group. In the 0-23 month age group, although it has a favorable chance of increasing the risk of stunting, it is not statistically proven. In this group, the relationship between the increase in the mother's CESD-10 score was not strong enough compared to other variables. This study shows that the relationship between increasing the CESD-10 score in mothers can increase the risk of stunting in children. Therefore examination and depression treatment remains to be done. Health assessment and screening mental health in pregnant women and giving birth can be done routinely at related health facilities. Maternal age has a negative association with stunting, so monitoring teenage pregnancy is increasingly essential. Mothers who experience

depression need help from others in childcare. Therefore it is necessary to strengthen the support system in the family and environment. The first thousand days of life are significant in determining the future. Still, the period after that, especially in the first five years, is equally essential. The focus on nutrition and other related factors is carried out on an ongoing basis. This study still has limitations. In this study, depressive symptoms are measured using the CESD-10 instrument with self-reported depression symptoms without a diagnosis by related health professionals. Also, in this study, the availability of data on children under five with stunting and maternal depression has an extended period. The number of samples that can be observed is less, and we cannot see the condition of postpartum depression. Therefore, the suggestion for further research is to consider the situation of postpartum depression experienced by mothers on the stunting status of children under five.

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Metabolic Risk Factors with Stroke Among Indonesians

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Abstract

Stroke is one of the leading causes of death. It is not only in the world but also in Indonesia. Various factors that trigger the incidence of stroke are known as metabolic risk factors. This study aims to determine the risk of stroke caused by one or more metabolic risk factors. This study used a retrospective cohort design from secondary data from the 2007 and 2014 Indonesia Family Life Survey (IFLS). The population was the population aged 15 years and over. The sample was the population who did not experience a stroke in 2007 as many as 7,707 people. The sampling technique used was multistage random sampling. The results showed that as much as 1.8% of Indonesia's population aged at least 15 years had a stroke. People with three metabolic risk factors had a 39.9 times higher risk of having a stroke than people without metabolic risk factors (95% CI: 29.3-54.4) after controlling for age, sex, and physical activity. Hypertension was a metabolic risk factor with the greatest risk for having a stroke. Therefore, preventive practices such as controlling and monitoring blood pressure, blood glucose levels and body weight can be carried out through regulating food consumption and engaging in regular physical activity.

Introduction

Stroke is the second leading cause of death worldwide (6.7 million) after a heart attack or ischemic heart disease (7.4 million). Furthermore, it is also the fourth primary cause of death in the UK, with over 100,000 sufferers each year. It is also known to kill an individual every 3 minutes 45 seconds, and a rate of 133,000 people annually in the United States, which makes it rank fifth. In Indonesia, it has become the leading cause of death, at 21.1% followed by ischemic heart disease (12.9%), diabetes mellitus (6.7%), tuberculosis (5.7%), hypertension and its complications (5.3%), transportation accidents (2.6%), pneumonia (2.1%) and diarrhea (1.9%). Meanwhile, the disorder of obesity makes it difficult to prevent hypertension and diabetes mellitus, subsequently increasing the prevalence of stroke (Ministry of Health Republic of Indonesia, 2017). These three conditions are collectively known as metabolic risk factors,

due to the relationship with the metabolic system of humans, which is modifiable.

Obesity is a risk factor for stroke. It is characterized by the accumulation of fat that exceeds the normal blood limit for a long time, as well as for coronary heart disease, hypertension, and diabetes mellitus. The prevalence of obesity has almost doubled throughout the world since 1980. Moreover, hypertension has also been attributed to the narrowing or thickening of artery walls (atherosclerosis) and the rupture of blood vessels in the brain, subsequently leading to ischemic and hemorrhagic strokes. Therefore, a higher value for blood pressure increases the chances of a stroke, where 51% of deaths are due to hypertension. It is also possibly caused by diabetes mellitus, resulting in brain atherosclerosis, being a chronic hyperglycemia condition characterized by a deficiency in secretion or a decline in the effectiveness of insulin. This further increases blood viscosity, leading to the manifestation of high blood

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pressure (hypertension), and subsequently causing a stroke (Ramadany, Pujarini & Candrasari, 2013; Kabi, Tumewah & Kembuan, 2015). Furthermore, diabetes mellitus affects 15-20% of the adult population and is also one of the major causes of ischemic stroke (Kabi, Tumewah & Kembuan, 2015; Ghani, Mihardja & Delima, 2016).

Several previous studies affiliated the metabolic factors of obesity, hypertension, and diabetes mellitus with the risk of stroke (Chen, Ovbiagele & Feng, 2016; Ghani, Mihardja & Delima, 2016; Gan et al., 2017; Tun et al., 2017; Zhang et al., 2017; Habibi-koolae et al., 2018; Owolabi et al., 2018; Soliman et al., 2018; Alharbi et al., 2019; Sofiana & Rahmawati, 2019). In addition, others include the non-modifiable age (Ghani, Mihardja & Delima, 2016), gender (Wang et al., 2019)) and modifiable factors, including deficiency in the consumption of vegetables and fruits (fiber) (Mo et al., 2019), physical activity (Reinholdsson, Palstam & Sunnerhagen, 2018), smoking status (Pan et al., 2019) and exposure to stressful conditions (Booth et al., 2015). This study is, therefore, aimed to identify the influence of metabolic factors (obesity, hypertension, and diabetes mellitus) as risk factors for stroke as a whole, and also in conjunction with others. Furthermore, a retrospective cohort design was used to observe the incidence of stroke for seven-year, hence the purpose of this study was to analyze the influence of risk factors affiliated with body metabolism, as well as other factors in people aged 15 years and older in Indonesia.

Method

This study used a retrospective cohort design, which was conducted through an analytical survey approach, using the Indonesian Family Life Survey (IFLS) 4 and 5 data. Also, all residents in Indonesia encompass the possible target population, using the successfully interviewed residents in 13 provinces in 2007 and 2014 as the study population. The sample comprises of individuals aged 15 years old and above, known to be free from a stroke in 2007, using the results collected for each complete record (inclusion criteria). Meanwhile, candidates missing from the observation (died or moved) and pregnant women were excluded,

leading to a sample size of 7,707 people.

Stroke is assessed based on the diagnosis of health workers (doctors, paramedics, nurses, or midwives) and categorized into two, including yes (ever diagnosed) and no (never diagnosed). In addition, the metabolic risk factors encompass hypertension (based on three measurements with an average value of 140/90 mmHg or more), obesity (based on Body Mass Index (BMI) values of 27 or more), and diabetes mellitus (based on diagnosis result by health professionals). The practice of a physical activity is grouped into two categories, including less (at a score less than 35), and sufficient (for scores over 35), while less fiber consumption is evaluated based on the frequency of ingesting green vegetables and fruits within the past week. It is categorized as yes (on instances where the score obtained is less than 11) and no (for scores over 11). Moreover, the smoking status of an individual is assessed with the question based on the presence of the habit as of the data collection time or the practice of its termination. Hence the subjects were categorized into three, encompassing smokers (have smoked up to the time of data collection), ex-smokers (smoked but had stopped), and non-smokers (never smoke). In addition, stress conditions were attained from several statements related to psychological health, including the feeling of being disturbed by non-existing things, depression, having difficulty concentrating, the demand for a lot of effort, fear, possessing good hopes about the future, being alienated, having sleep trouble, and the inability to start anything. The declaration of positive statements is provided with a score of 1 (frequently: 5-7 days), 2 (sometimes: 3-4 days), 3 (a few: 1-2 days) and 4 (rarely: <1 day), while negative statements are given 4 (often: 5-7 days), 3 (sometimes: 3-4 days), 2 (few: 1-2 days) and 1 (rarely: <1 day). These parameters are collectively categorized as yes (with a total score of 5 or more) and no (the total of less than 5). However, the non-modifiable risk factors include age (using a ratio scale) and gender, which were grouped into males and females.

Weighting, province (cluster), and enumeration area (strata) are needed in complex sample analysis to obtain a similar selection probability for each item (Equal Probability of

Selection Method/ EPSEM). Modifiable (body metabolism, physical activity, smoking status, and stress condition) and non-modifiable (age and gender) risk factors are described using univariate analysis. Meanwhile, the bivariate evaluation was performed using the Chi-Square Test, to determine the effect of various risk factors on the incidence of stroke in crude association, with a significance level of 5% and confidence interval of 95%. Furthermore, a multivariate analysis was conducted using multiple logistic regression tests to obtain the adjusted association, and the results are presented in the form of cross-tabulation and narrated explanations.

Result and Discussion

The result of the univariate analysis

showed the occurrence of stroke in 1 to 2 out of every 100 Indonesians, while 30 out of every 1000 people suffer from a combination of three metabolic diseases at once (obesity, hypertension, and diabetes mellitus). Furthermore, 8 to 9 out of every 100 individuals suffer from obesity and hypertension, 30 to 31 out of every 100 experiences hypertension alone, while 51 to 52 out of 100 suffer from no metabolic syndrome. The male respondents were 3.6% less than female, and 49 to 50 out of every 100 people participate in proper physical activity, while the number of smokers was 36.8% more than non-smokers. In addition, 5 to 6 out of every 100 people consume less fiber, while 52 to 53 experience stress, with the average age of respondents being 52.17 years old (Table 1).

Table 1. Distribution of Respondent Characteristics (n=7,707)

Characteristics	Frequency (n=7,707)	Percent (%)
Stroke		
Yes	140	1,8%
No	7567	98,2%
Metabolic Risk Factors		
Hypertension, obesity and diabetes mellitus	23	0,3%
Diabetes mellitus and obesity	19	0,2%
Diabetes mellitus and hypertension	54	0,7%
Obesity and hypertension	667	8,6%
Diabetes mellitus	52	0,7%
Obesity	571	7,4%
Hypertension	2345	30,4%
Nothing	3976	51,6%
Gender		
Male	3713	48,2%
Female	3994	51,8%
Physical Activity		
Less	3921	50,9%
Sufficient	3786	49,1%
Smoking Status		
Smokers	2314	30,0%
Ex-smokers	244	3,2%
Non-smokers	5149	66,8%
Fiber Consumption		
Less	4207	54,6%
Sufficient	3500	45,4%
Stress		
Yes	4060	52,7%
No	3647	47,3%
Age (year)		
Mean and 95% CI	52,17 (95% CI: 52,04-52,30)	

Source: Secondary Data from IFLS 2007 and 2014 (Processed Data 2019)

The results of the bivariate analysis showed a higher risk for stroke with the increase of metabolic diseases, including obesity (RR: 2.4; 95% CI: 1.6-3.6), diabetes mellitus (RR: 6.5; 95% CI: 3.6-11.9), and hypertension (RR: 7.5; 95% CI: 5.9-9.6). However, respondents with a combination of two, comprising of obesity and hypertension, experienced the lowest risk with RR: 10.3 (95% CI: 7.6-14.0), followed by diabetes mellitus and hypertension (RR: 27.2; 95% CI: 20.5-36.1) and finally the mixture of diabetes mellitus and obesity (RR: 28.9; 95% CI:

8.5-98.6). The respondents with three metabolic diseases, at the same time, had the highest risk of stroke, with RR: 37.4 (95% CI: 27.1-51.7). Conversely, the unmodifiable risk factors (age and sex) influence the incidence of stroke, which is also observed with the modifiable forms (smoking status and physical activity), although a deficiency in the consumption of vegetables and fruits (fiber), as well as the exposure to stressful conditions, have not proven to be influential (p-value > 0.05) (Table 2).

Table 2. Risk Factors of Stroke among Indonesians

Risk Factors	Stroke				p-value	RR (95% CI)
	Yes		No			
	n	%	n	%		
Metabolic Risk Factors						
Hypertension, obesity and diabetes mellitus	3	14.1	20	85.9	< 0.001*	37.4 (27.1-51.7)
Diabetes mellitus and obesity	2	11.3	17	88.7	< 0.001*	28.9 (8.5-98.6)
Diabetes mellitus and hypertension	6	10.7	48	89.3	< 0.001*	27.2 (20.5-36.1)
Obesity and hypertension	29	4.3	638	95.7	< 0.001*	10.3 (7.6-14.0)
Diabetes mellitus	2	2.8	50	97.2	< 0.001*	6.5 (3.6-11.9)
Obesity	6	1	565	99	< 0.001*	2.4 (1.6-3.6)
Hypertension	75	3.2	2270	96.8	< 0.001*	7.5 (5.9-9.6)
Nothing	17	0.4	3959	99.6	-	Reference
Gender						
Male	77	2.1	3636	97.9	< 0.001*	1.3 (1.2-1.5)
Female	63	1.6	3931	98.4	-	Reference
Physical Activity						
Less	86	2.2	3835	97.8	< 0.001*	1.6 (1.4-1.8)
Sufficient	54	1.4	3732	98.6	-	Reference
Smoking Status						
Smokers	35	1.5	2279	98.5	0.005	0.8 (0.7-0.9)
Ex-smokers	5	2.2	239	98.1	0.498	1.1 (0.8-1.6)
Non-smokers	99	1.9	5050	98.1	-	Reference
Fiber Consumption						
Less	76	1.8	4131	98.2	0.915	1.0 (0.9-1.1)
Sufficient	64	1.8	3436	98.2	-	Reference
Stress						
Yes	74	1.8	3986	98.2	0.804	1.0 (0.9-1.2)
No	65	1.8	3582	98.2	-	Reference
Age (year)						
Mean		56.87	52.09		< 0.001*	1.047 (1.041-1.053)

Source: Secondary Data from IFLS 2007 and 2014 (Processed Data 2019)

This study also uses multivariate analysis to obtain adjusted risk values for stroke incidence, which remains higher in respondents with three metabolic diseases than for individuals possessing only one or two. In

addition, the risk factors of physical activity, age, and gender also control the manifestation of stroke (RR: 39.9; 95% CI: 29.3- 54.4; p < 0.001) (Table 3).

Table 3. Risk Factors of Stroke among Indonesians using Multiple Logistic Regression

Variables	First Model		Last Model	
	p-value	RR _{crude} (95% CI)	p-value	RR _{adjusted} (95% CI)
Metabolic Risk Factors				
Hypertension, obesity and diabetes mellitus	< 0.001	37.8 (27.5-51.9)	< 0.001	39.9 (29.3-54.4)
Diabetes mellitus and obesity	< 0.001	37.9 (10.7-134.8)	< 0.001	38.1 (10.6-136.6)
Diabetes mellitus and hypertension	< 0.001	21.4 (16.1-28.4)	< 0.001	21.9 (16.7-28.9)
Obesity and hypertension	< 0.001	11.4 (8.3-15.7)	< 0.001	11.6 (8.5-15.9)
Diabetes mellitus	< 0.001	5.2 (2.8-9.5)	< 0.001	5.1 (2.8-9.3)
Obesity	< 0.001	3.0 (1.9- 4.6)	< 0.001	3.1 (2.0-4.6)
Hypertension	< 0.001	6.4 (5.0-8.1)	< 0.001	6.5 (5.1-8.2)
Age	< 0.001	1.037 (1.031-1.043)	< 0.001	1.037 (1.031-1.043)
Gender	< 0.001	2.1 (1.8-2.4)	< 0.001	1.7 (1.5-1.9)
Physical Activity	0.003	1.2 (1.1-1.4)	0.003	1.3 (1.1-1.5)
Smoking Status				
Smokers	< 0.001	0.7 (0.6-0.8)	-	-
Ex-smokers	0.015	0.6 (0.5-0.9)	-	-
Fiber Consumption	0.564	1.04 (0.91-1.2)	-	-
Stress	0.931	0.9 (0.8-1.1)	-	-

Source: Secondary Data from IFLS 2007 and 2014 (Processed Data 2019)

Stroke is an acute, diffuse, or focal brain dysfunction originating from vessels and lasting for a period longer than 24 hours. Types of stroke are intracerebral hemorrhages, subarachnoid hemorrhages, ischemic, and cerebral venous sinus thrombosis. Stroke has been considered the third most common cause of death besides cardiovascular diseases and malignant tumors (Alrabghi et al., 2018). The results obtained showed the occurrence of stroke in one to two out of 100 residents aged 15 years and older, between 2007 and 2014. Additional information was obtained from the diagnosis of doctors, nurses, paramedics, or midwives, and the study outcomes were supported by previous researches, which demonstrated an increase in prevalence from 7‰ to 10.9‰ within the period of 5 years (2013 to 2018; Ministry of Health Republic of Indonesia, 2019).

Metabolic risk factors are important in predicting the incidence of stroke, including (1) the waist circumference measurement of over 40 inches for males or 35 inches for females, (2) fasting blood sugar of more than 100 mg/dl, (3) triglyceride levels above 150 mg/dl, (4) blood pressure > 130/85 mmHg and (5) fasting HDL of less than 40 mg/dl in male or 50 mg/dl in female (Khafagy et al., 2019). These conditions possibly affect and disrupt

body metabolic processes, subsequently increasing the risk for stroke. Based on Imanda et al., Sofiana & Rahmawati and Riyadina & Rahajeng studies have shown that hypertension has a significant influence on stroke (Riyadina & Rahajeng, 2013; Imanda, Martini & Artanti, 2019; Sofiana & Rahmawati, 2019). However, this is higher in respondents suffering from three metabolic diseases at a time, compared to those experiencing one or two, as supported by previous studies (Renjen, Beg & Ahmad, 2015; Hörnsten et al., 2016; Boehme, Esenwa & Elkind, 2017; Hong, 2017; Furlan et al., 2018). Hypertension is one of the cognitive impairment risk factors after Ischemic Stroke. The process of cognitive impairment in patients with hypertension begins with the occurrence of pathological changes in the blood vessels of the brain causing abnormalities in the brain vessels. Abnormalities and damage to brain vessels will cause an increased risk of cognitive impairment (Nurani, Martini & Marzela, 2019). Meanwhile, Endarti and Handito's previous study showed that people who have a history of at least one type of NCDs run the risk six times more likely to experience the poor health-related quality of life (POR: 5.581; 95% CI: 3.883 to 8.020) (Endarti & Handito, 2016).

Physical activity (PA) is another mo-

difficult risk factor, as respondents that rarely participate (less physical activity) were comparably at more risk than those with sufficient physical activity (OR: 3.5; 95% CI: 1.2-10.2). It is in line with a study that identified a 7.4% less incidence of stroke in physically active residents aged ten years and above (Ministry of Health Republic of Indonesia, 2019). The practice of a sedentary lifestyle leads to a build-up of fat, cholesterol, and calcium, which tend to interfere with the flow of blood to the brain and heart, subsequently leading to stroke or death. The previous study conclude that physical activity was not only a predictor for body mass index, but also a determinant of type 2 diabetes mellitus (Botabara-Yap, Estrada & Balila, 2019; Kandou et al., 2019; Simbolon, Siregar & Talib, 2020). Stroke guidelines from the American Stroke Association recommend at least 40 min/day of moderate to vigorous-intensity aerobic PA 3 to 4 days/week. Moderate-intensity exercise was defined as sufficient to break a sweat or noticeably raise heart rate (eg: walking briskly, using an exercise bicycle). The World Health Organization also recommends 150 min/week of moderate-intensity exercise or 75 min/week of vigorous-intensity exercise includes activities such as jogging (Jeong et al., 2017; Prior & Suskin, 2018).

These risks were elevated with age, as seen in 1.9%, 2.7%, and 3.2% of respondents at 40, 50, and 65 years or more, respectively. Furthermore, amongst the individuals experiencing a combination of three metabolic diseases, 14 to 15 of those aged 15-40 years were suffering from strokes, as this age group had a proportion of less physical activity (0.633%) that was slightly higher than sufficient physical activity (0.628%). Also, the obese proportion was more significant amongst respondents living a sedentary lifestyle, compared to the more active persons (13.1% and 7.7%), which was lesser in females (53.1%) than males (38.7%). It is an indication of higher risk in females at this age group, although individuals that were 15-50, and 15-64 years exhibited higher values in males than females. However, there was a higher prevalence of stroke in 15-64 years old participants lacking physical activity, consuming fewer vegetables and fruits (fiber), and experiencing stress. The results are

supported by the outcome of previous research like Anderson & Durstine, 2019; Everson-Rose et al., 2014; Hankey, 2017; Kotłęga et al., 2016; Li et al., 2017, meanwhile the Total Diet Study in 2014 and some others identified similarity with the consumption of excessive sugar, sodium and the presence of hypertension, which is experienced more by males (Thaha, A & A, 2016; Ministry of Health Republic of Indonesia, 2017).

The results identified the importance of conducting physical activity as a preventative measure for the occurrence of metabolic diseases, known to impact the increased incidence of stroke. The Ministry of Health launched an effort to prevent and control non-communicable diseases through the conduction of "Gerakan Masyarakat Hidup Sehat". It involves carrying out preventive behaviors, including periodic health check-ups (measuring blood pressure, blood sugar levels, cholesterol levels, stomach circumference, pulse, body weight, and height), avoiding and slowly quitting the habit of smoking, conducting physical activity (exercise at least half an hour per day for three to five days a week), consuming nutritious and balanced food, acquiring enough rest and stress management. This conduct is also termed "CERDIK" behavior, alongside the practice of preventive efforts and raising awareness for stroke sufferers, as a control measure to always "PATUH". Furthermore, the approach involves routine participation in health checks according to doctor's advice, obtaining proper and regular treatment, consuming nutritious and balanced food, engaging in physical activities, which is adjusted to the ability of each patient, and also the avoidance of alcohol, cigarettes, and other harmful substances (Ministry of Health Republic of Indonesia, 2014).

Conclusion

A total of one to two out of 100 residents aged 15 years and above had a stroke (1.8%), based on the observation conducted for seven years. This value was simultaneously influenced by the risk factors of metabolic, physical activity, gender, and age, as a higher incidence was affiliated with an increase in the experience of metabolic diseases. However, it is possible for individuals that have not suffered a stroke

to make preventive efforts by implementing a healthy lifestyle and engaging in physical activities. It includes the practice of regular exercise, monitoring and controlling blood pressure, cholesterol, blood sugar, and body weight, as well as recognizing the symptoms of stroke, encompassing the presence of asymmetrical smile, weak/ paralyzed hand and foot movements, speaking unclearly, numbness throughout the body and around the mouth, double vision/sudden loss of vision in one eye, impaired balance, decreased consciousness/unconscious, vomiting, and headache. However, individuals experiencing the three diseases related to metabolism are recommended to maintain physical activities adapted to the ability, including walking activities for a quarter of an hour in the morning and routinely participating in stretching exercises. This practice possibly enhances limb training (muscles and joints), blood circulation, and O₂ supply in the body, which consequently optimizes metabolism. In addition, it is also necessary to conduct routine checks on blood pressure, sugar levels, and body weight, limiting the use of table salt and high sodium food ingredients, restricting the intake of fried food or high coconut milk diet, and also avoiding corned beef, sausages, sardines, organ meats, being sources of high saturated fat from animals.

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Trend for Risk Covid-19: A Case Study in Indonesia

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Abstract

Since the end of 2019, the whole world has been shocked by the increasing outbreak of Covid-19 including in Indonesia. Google trend data provides important information that supports decision making. The aims of this study for measuring the activities of cyber users to get the latest information regarding the spread of Covid-19, the use of masks, the importance of maintaining personal hygiene, lockdown, environmental cleanliness, and being able to predict an increase or decrease in Covid-19 cases. This study explores data using google trends to reduce the number of Indonesian citizens' anxiety in the Covid-19 case. the data was analysis using stata for Time-Lag Correlation. Relative search volume (RSV) by using Google Heat Map. The correlation test RSV between Covid-19 cases and the use and price of masks, hand washing and, number of cases Covid-19. the test shows that the value of F (2, 242). The variables tested were 2 variables, namely the use of masks and washing hands while the observed number was 242. The R-Squared value showed 0.1163 that all independent variables had an effect on the dependent variable.

Introduction

Officially on February 1, 2020, WHO officially announced that around the world there were 11,953 cases of Covid-19. A total of 11,821 came from China (World Health Organization, 2020b; WHO, 2020). The spread of Covid-19 is very fast, the first spread occurred in China, which is located in Wuhan. In general, WHO confirmed as many as 896,475 cases (positive), 45,525 (died). Subsequently spread in 27 countries. Since the increase in cases occurred, the WHO issued a pandemic mandate as a health emergency status. At present the highest case of Covid-19 that has caused death occurs in the United States of 20444 (WHO, 2020) the central government is very active in monitoring to reduce the spread rate even higher and prevent cases of very fast death (Burke et al., 2020).

The first case occurred in the city of Wuhan, China, which originated from an animal market, actually Covid-19 is a type of influenza virus that originally only occurred in

animals, but now can be transmitted to humans. This virus has been around for 200 years, but along with the development of the virus and environmental conditions, this type of virus changes the incubation period into 4 types of incubation and without any early symptoms (Gao et al., 2020). The spread is very fast to various countries in the world, one of which is Indonesia.

Indonesia was confirmed as a country with Covid-19 cases, from WHO data there were 1677 confirmed cases of Covid-19 (149 new cases), 157 (died) and, 21 (new death cases) (Lauer et al., 2020). With the emergency response issued by WHO, the Government of Indonesia said to prevent an increase in the number of Covid-19 transmissions by carrying out social distancing and physical distancing. Of course, this is very influential in various sectors in Indonesia, because there are limited activities, thus sparking ideas for policymakers to carry out all activities online (Tanser & le Sueur, 2002)

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Renewable data accessed from the Covid-19 website as of March 22, 2020, globally there were 1,773,084 cases of Covid-19 (confirmed positive), 111,653 (died) and 449,589 (recovered). For cases that occurred in Indonesia 4,555 (confirmed positive), 399 (died), and 380 (recovered) (WHO, 2020). With easy access to information in cyberspace related to this case, people all over the world can certainly protect themselves and increase awareness of healthy living. The use of search engines in cyberspace whose data is used, processed, and analyzed provides information for policymakers in making decisions, supporting researchers to use the Google Trend (GT) data for Covid-19 Cases in Indonesia predicting an increase or decrease in the Covid-19 outbreak (Schwartz et al., 2020)

Method

We retrieved google trend (GT) data for the specific locations of Indonesia nationwide and subregions using defined search terms related to coronavirus, handwashing, and number of case covid-19. All data was analysis using Stata. using google trends to get location-specific data in Indonesia and search sub-categories about Covid-19, masks, hand hygiene, and cases. Relative search volume (RSV) data filter by geografihic region in Indonesia using Google Heat Map. Time-lag for correlation was analysis using Stata version 13.

Result and discussion

Search related to covid-19 (figure 1) in Indonesia at an early stage occurred in January 2020, when WHO declared that Covid-19 was an epidemic and a world emergency alert (WHO, 2020b). In Indonesia there was an increase and the first wave occurred at its peak on April 16, 2020 when there was local transmission and along with this data, WHO declared vigilance over this situation where the death rate due to Covid-19 has been recorded in Indonesia (WHO, 2020c). a few weeks later the information in the world there was a significant increase in mortality (Burke et al., 2020), and it was predicted that there would be a second wave in China (Davis et al., 2020).

Table 1 shows the τ -time-lag correlation between the causes of the coronavirus and the incidence of covid-19 with the number of local transmissions where the R-Squared value shows 0.3886 that the independent variable affects the dependent variable. By examining the relationship using time-lag correlation, it can use as a basis for predicting the incidence rate of increasing or decreasing (Husabø et al., 2020). It very helpful for policymakers to make decisions to reduce the incidence of covid-19 (Husnayain et al., 2020; Xiong et al., 2020). In addition, face masks increasing as cases of Covid-19 have spread to several countries and the availability of surgical masks is scarce (Esposito et al., 2020).

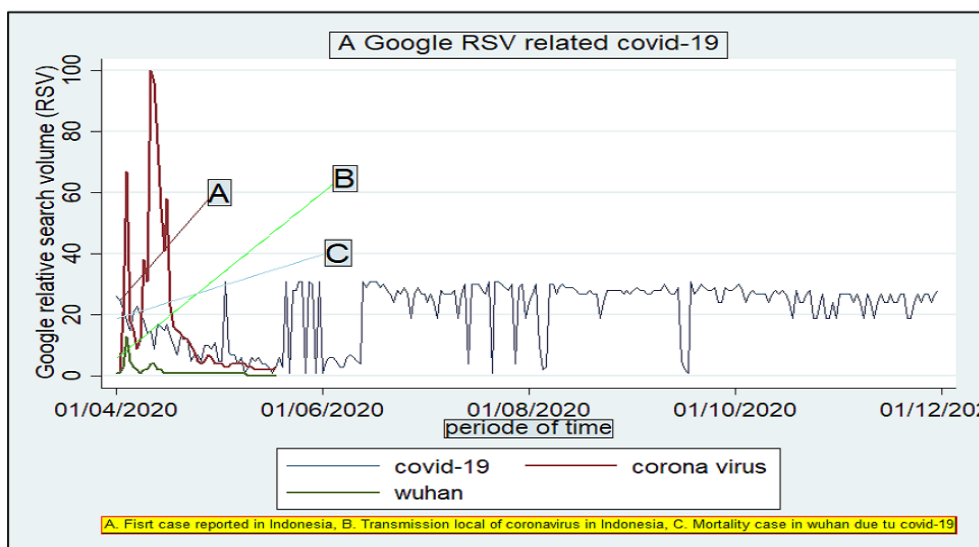


Fig. 1 Time Series of Google RSV Related to Covid and COVID-19 Cases in Indonesia
Source: Secondary data, 2020

Table 1. Time-lag Correlations between Google RSV Related to COVID-19 and COVID-19 Cases in Indonesia

Source	SS	df	MS	Number of obs =	48
Model	1005.6176	2	502.808802	F(2, 45) =	15.93
Residual	1420.04906	45	31.5566459	Prob > F =	0.0000
Total	2425.66667	47	51.6099291	R-squared =	0.4146
				Adj R-squared =	0.3886
				Root MSE =	5.6175

corona	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
covid_19	-.101452	.2215665	-0.46	0.649	-.5477099 .3448059
number_of_cases	1.376637	.2450499	5.62	0.000	.8830812 1.870193
_cons	-9.988814	4.004916	-2.49	0.016	-18.05513 -1.922499

Source: Secondary data, 2020

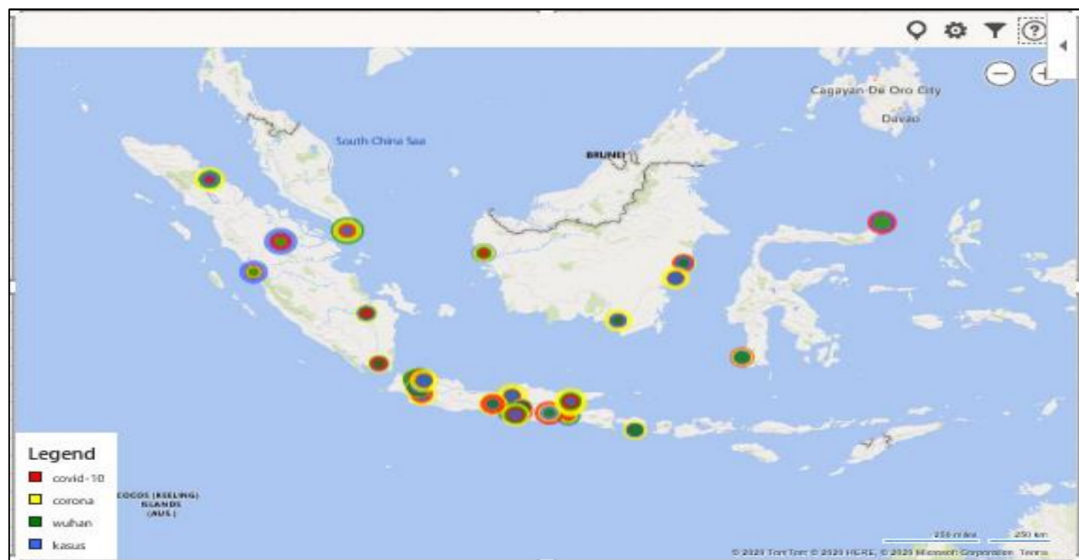


Fig. 2. Map of the Distribution of Interest of Time Covid-19 per Region in Indonesia
 Source: Secondary data, 2020

Figure two shows the interest of time in the highest area distribution for Covid-19 cases in the Java region. Several health facilities reported about Covid-19 clusters (Li et al., 2020). The number of incidents with Indonesian citizens' efforts to anticipate staying at home (Gao et al., 2020). Trends that occur and helpfully know the distribution of areas so that epidemiologists can take preventive action as early as possible (Schulz et al., 2018).

The information presented in the (table 2) of the correlation statistical test between RSV and Covid-19 cases, the use and price of masks,

washing hands and, the number of Covid-19 cases shows that the F value (2, 242) shows the variables tested, there are 2 variables, namely the use of masks and washing hands while the observed number was 242. The R-Squared value showed 0.1163 that all independent variables had an effect on the dependent variable. WHO recommends tightening health protocols, especially the use of masks, maintaining hand hygiene because the number of deaths in several countries is increasing very high (Yokohama, 2020; Ramadona et al., 2019; WHO, 2020a). Not only hand hygiene, but the number of

local transmissions that occur has added to the family and workplace clusters (Gao et al., 2020).

Table 2. Time-lag Correlations between Google RSV Related to COVID-19 and Hand-wash in Indonesia

Source	SS	df	MS	Number of obs =	245
Model	2605.80066	2	1302.90033	F(2, 242) =	15.92
Residual	19804.7544	242	81.8378283	Prob > F =	0.0000
Total	22410.5551	244	91.8465373	R-squared =	0.1163
				Adj R-squared =	0.1090
				Root MSE =	9.0464

corona	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
mask	-.1055118	.0711428	-1.48	0.139	-.2456499 .0346263
hand_wash	-.7637151	.1812578	-4.21	0.000	-1.120759 -.4066706
_cons	26.66171	1.14628	23.26	0.000	24.40375 28.91967

Source: Secondary data, 2020

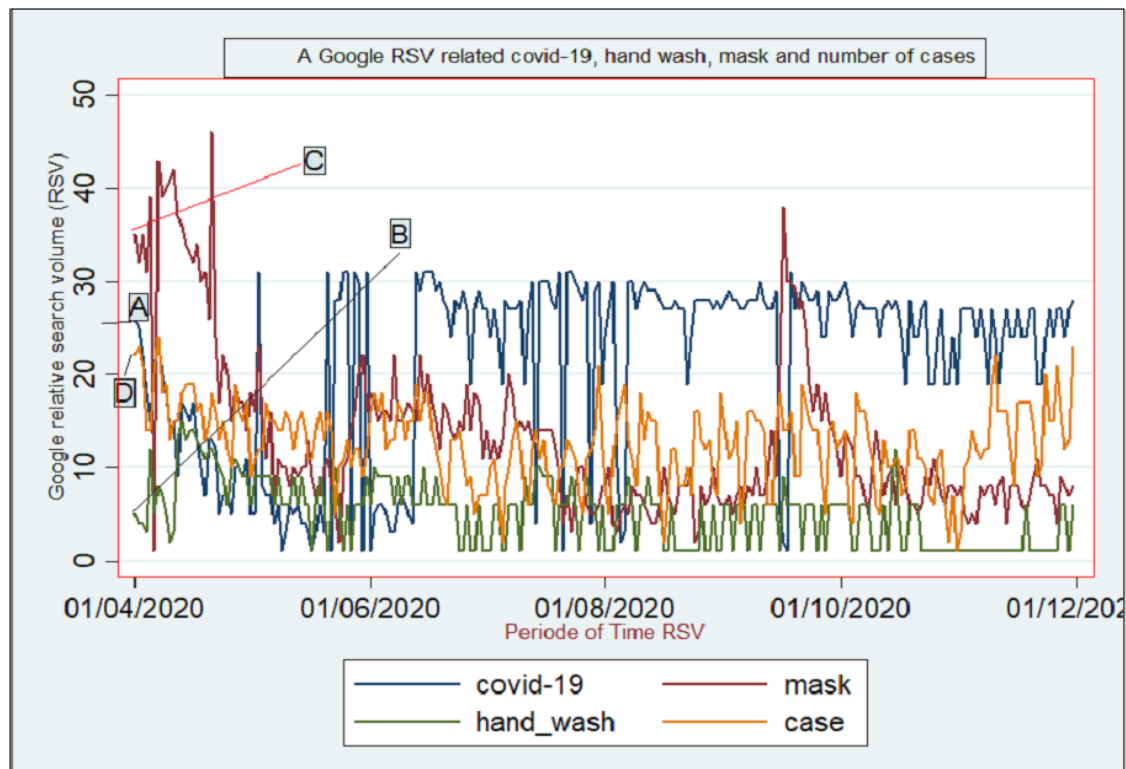


Fig. 3 Time Series of Google RSV Related Face Mask, Hand Wash and COVID-19 Cases in Indonesia
Source: Secondary data, 2020

The figure three shows that search activities occurred in the period from April to December 2020. At point A, it shows that data accessed with the keyword covid-19 that occurred in Indonesia (April 22th, 2020) is the first wave until May 2nd, 2020, and decreased again on May 15th, 2020. Then there was a Second wave, until its peak on June 14th, 2020, until December it was still sloping with high

intensity. The second addition is the keyword washing hands is marked with the letter B. in green, indicating that this activity was accessed for the first time on April 2nd, 2020 in line with the circulating information on Covid-19 in Indonesia. Accessibility is relatively up and down on May 15th, 2020, when it happened along with the increasing cases of Covid-19 in Indonesia. Until December the search trend

was relatively stable without any high waves. An addition is a search with the keyword mask marked with the letter C. The data obtained by access began on April 4th, 2020, in line with the increase in local transmission of Covid-19. There were 2 waves, the first wave peaked on 28 April 28th, 2020 and sloped down, while the second wave occurred on May 7th 2020 and decreased drastically on May 11st 2020, while the third wave occurred on October 2020 when the Covid-19 case occurred because there was an additional family clusters, work location clusters and the existence of new norms.

WHO also recommends that the use of surgical masks be prioritized for health workers, while civilians are advised to use non-surgical masks and it is declared that wearing masks will reduce the transmission of covid-19 cases (Schulz et al., 2018), besides that certain masks do not only protect transmission but can also prevent local transmission because the condition of the boundaries in several countries, one of which is Indonesia, has returned to normal (Wong et al., 2020; Li et al., 2020; Y. Wu et al., 2020)

In addition, information related to

washing hands is relatively stable, has increased when the case of Covid-19 has increased again, this shows that public awareness of the importance of a healthy lifestyle, personal health and, proper hand wash procedures to support and prevent contracting Covid-19 (Romanov, 2020; Xiong et al., 2020). Accuracy in hand wash can have a personal health effect when there is a missed mask after making contact with other people (J. T. Wu et al., 2020; Esposito et al., 2020; Jin et al., 2020).

Meanwhile, (figure 4) shows the distribution of covid-19 cases in Indonesia has increased for two weeks after being informed of a new normal. The distribution center is in Java, number two on Sumatra, Kalimantan, Sulawesi, and Papua. There are indicates that the increase is a form of awareness of the equal distribution of covid-19 cases in Indonesia. The leg-interest of time shows information searches a week after dissemination for information from each region is getting higher. The rate of local transmission cases so very tight monitoring further increases spread if Indonesians disobedient the protocol (Schwartz et al., 2020; Matuschek et al., 2020)

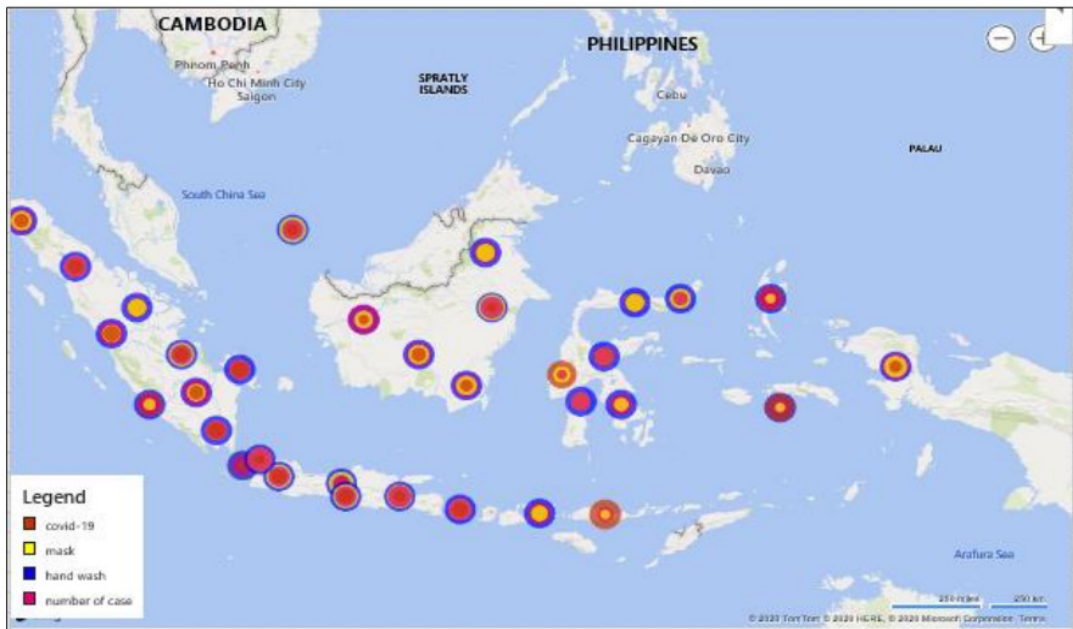


Fig.4 Map of the Distribution of Interest of Time Related Face Mask, Hand Wash and COVID-19 Cases per Region in Indonesia
Source: Secondary data, 2020

Conclusion

Time-lag correlation between the causes of the coronavirus and the incidence of covid-19 is with the number of local transmissions, where the R-Squared value shows 0.3886 that the independent variable affects the dependent variable. The interest of time in the highest area distribution for Covid-19 cases in the Java region. Several health facilities reported about Covid-19 clusters. The number of incidents with Indonesian citizens' efforts is to anticipate staying at home. The rate of local transmission cases so very tight monitoring further increases spread if Indonesians disobeyed the protocol. The distribution of covid-19 cases in Indonesia has increased for two weeks after being informed of a new normal. The distribution center is in Java, number two on Sumatra, Kalimantan, Sulawesi, and Papua. There are indicates that the increase is a form of awareness of the equal distribution of covid-19 cases in Indonesia. The leg-interest of time shows information searches a week after dissemination for information from each region is getting higher

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Analysis of Healthy Housing and TB Prevalence in Yogyakarta City

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Abstract

Environmental health is one of the determinants factors toward the public health status. Transmission of tuberculosis (TB) is influenced by environmental factors. Based on previous TB data in local study, it shows that urban areas (urban) have a high case rate. Therefore, this study aims to reveal the disparity of urban TB sufferers, especially in the city of Yogyakarta based on indicators of the physical environment of the house from the coverage of healthy households. The method of study used is quantitative descriptive analysis of secondary data. The data used were the physical environment of the house which is obtained from healthy housing data and TB prevalence data in Yogyakarta City. The secondary data spread over 18 Public Health Centers in Yogyakarta City. The data collected include healthy housing data and BTA (+) cases data in the study scope using total sampling technique. Based on the trend analysis, it was found that there was a significant trend in data. The higher percentage of non-healthy housing coverage was associated in line with the higher the TB prevalence rate. It can be concluded that the physical environment factor of the house as an indicator of a healthy housing is closely related to the incidence of TB in Yogyakarta City. Environmental quality studies need to be carried out for comprehensive TB disease control towards elimination (End TB 2030) which is in line with national programs and SDGs goals.

Introduction

Tuberculosis (TB) becomes world's communicable diseases (Álvarez-Meca et al., 2016). TB is a chronic infection which takes from weeks to months for manifestation of the disease by the *Mycobacterium tuberculosis* bacteria, whose spread is influenced by environmental factors through environmental air compartments (Muslimah & Dwi, 2019). This environmental-based disease still reaches high rates every year and important public health problem in Indonesia (Sugandi, et.al. 2018). The number of pulmonary TB patients in Indonesia was ranks fourth in the world after India, China, South Africa with a TB prevalence of 285 per 100,000 population or 302,861 cases in 2010 (WHO, 2010). According to the recapitulation of surveillance data from Provincial Health Office in Yogyakarta, in 2019 TB BTA (+) cases was still found in Yogyakarta City. The number of TB category BTA (+)

in Yogyakarta City has increased for three consecutive months, 32 cases in May, 37 cases in June, and 40 cases in July 2019.

TB cases related with environmental factors include physical environment (Schmidt, 2008). Environmental conditions, especially household conditions also have a role in the spread of pulmonary TB bacteria to healthy people (Taha et al., 2011). This study in line with Suharyo (2013) that the cleanliness of the households environment can also affect the spread of the virus, for example a house that is poor ceiling setting which can facilitate the spread of TB. The spread of pulmonary tuberculosis bacteria will attack healthy people more quickly if they are in a humid, less light and densely populated house (Handriyo & Wulan, 2017).

People exposed to a person with TB caused by household contacts (Singh et al., 2013). Household contacts become primarily

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risk factors for TB with high index cases, such as poverty, poor housing and environmental conditions (Sulis et al., 2014), health determinants, including HIV status, nutrition and access to healthcare (Loñnroth et al., 2010). The previous study reported that prevalence of TB was found to be the highest among elderly people (0.9%), no education (0.4%) and people belonging to the poorest wealth quintile (0.53%) (Singh et al., 2018). In fact, there were multiple risk factors that are strongly associated with Tuberculosis such us smoking habit in house, cooking fuel type, floor, number of persons sleeping in a room (Narasimhan et. al., 2013) and individual characteristics such as age, sex, educational attainment, marital status, place of residence and wealth index (Singh et al., 2018; Shimeles et al., 2019).

The poor quality of physical environment in the house will be potential risk factors to the pulmonary TB diseases. It has attracted the attention of the author to further examine the perspective of the household environment quality as a determinant of TB incidence in urban areas and to formulate appropriate strategies for TB control. Therefore, this study aims to reveal the disparity of urban TB sufferers, especially in the city of Yogyakarta based on indicators of the physical environment of the house from the coverage of healthy households based on community data. Research is limited on this topic, so that environmental quality studies need to be carried out in a comprehensive TB disease control towards elimination of End TB 2030 program which is in line with national programs and SDGs goals.

Method

The method used in this study is quantitative descriptive analysis. The data used is the physical environment data of the house which is obtained from data on healthy houses in Yogyakarta City and TB prevalence data for Yogyakarta City in the period 2018-2020. The sample study comes from secondary data spread over 18 Public Health Centers in Yogyakarta City. The data collected include healthy houses data and BTA (+) cases data in the study scope. The sampling technique used the total sampling which the sample size similar as the population number, all secondary data sources from all health centers in Yogyakarta city. The data analysis used was descriptive analysis to describe the trend indicators for healthy households with TB incidence. Ethical approval for this study was approved in 2020 by the Ethics Committee of Ahmad Dahlan University No. : 012004016.

Result and Discussion

The tuberculosis prevalence rate describes the number of new TB patients and it is recorded per 100,000 population. The classifications of TB reported in the Yogyakarta City Health Office include bacteriological confirmed of pulmonary TB cases, clinically diagnosed pulmonary TB, and extra-pulmonary TB. There were four types of patients, including new patients, relapse patients, patients with a history of TB-treatment Apart From relapse, and patients with no previous history of TB-treatment. Here are graph of TB cases in Yogyakarta City in 2019 (Figure 1):

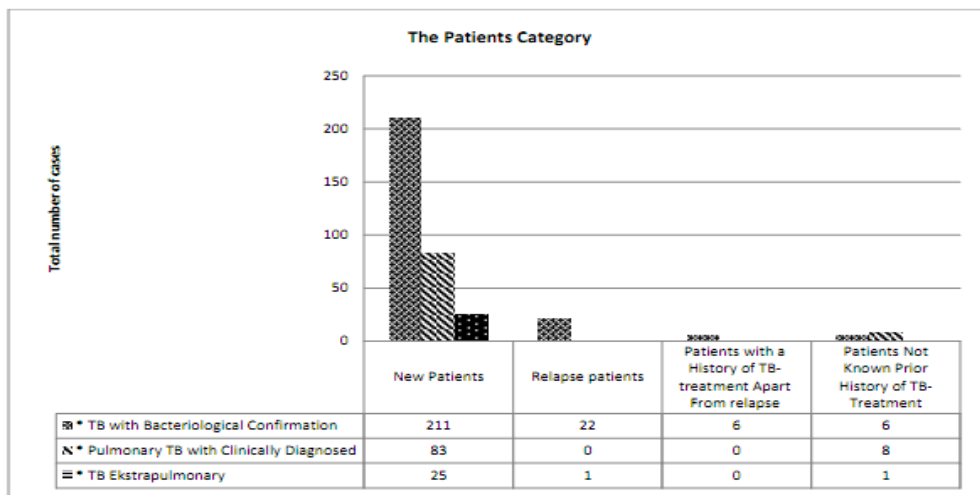


Figure 1. Graph of TB in Yogyakarta City in 2019

This study focuses on new bacteriologically confirmed pulmonary TB cases. The cases recorded at the Health Office of Yogyakarta City from the January-June Period (TW1-TW2) were 69 cases in 2020. Meanwhile, the Q3 data is still validation by the Yogyakarta City Health Office and Q4 2020 is still in the entry process at the respective public health center office. Based on 2020 data, there was a decrease in cases. Comparison of

bacteriological confirmed pulmonary TB cases in 2019 and 2020 can be seen in the following graph:

The jurisdiction area of the Health Office of Yogyakarta City has 18 public health centers unit. Each public health center carries out its TB surveillance function regularly. The following Figure 3 is a graph of new bacteriological confirmed pulmonary TB cases based on public health centers unit in 2019:

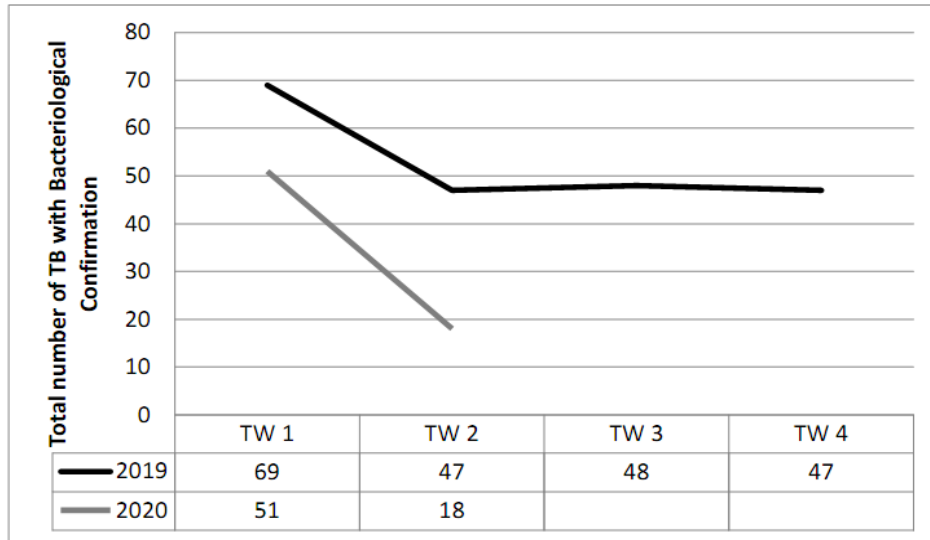


Figure 2. Comparison of Bacteriologically Confirmed Pulmonary TB Cases in 2019 and 2020

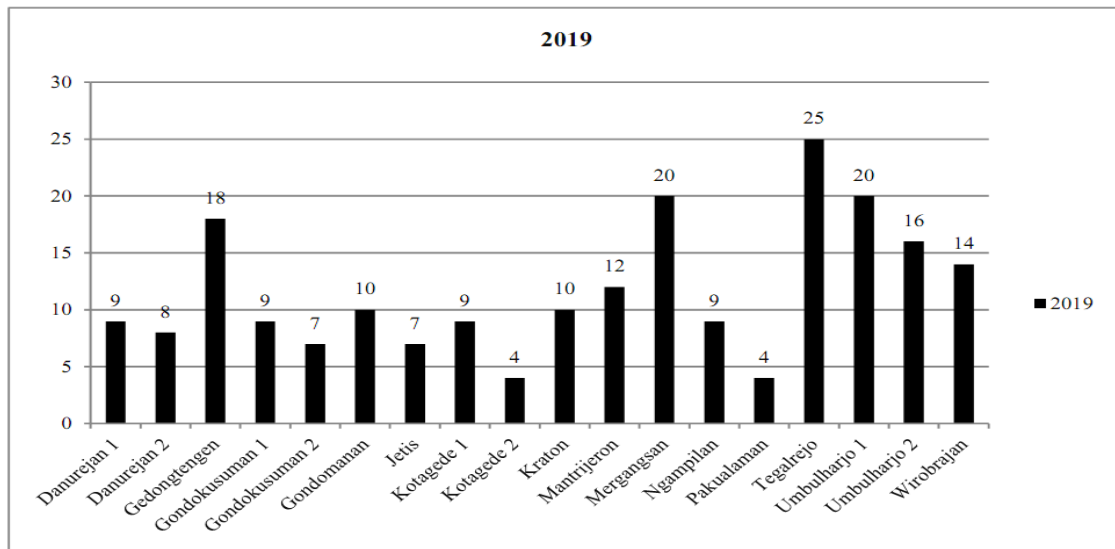


Figure 3. Graph of New Bacteriological Confirmed Pulmonary TB cases Based on Health Centers Unit in 2019

The TB case data in 2020 were showed in Figure 4 below which contains bacteriological confirmed data of New TB Patients, relapse

patients, patients with treatment history, and patients without treatment history.

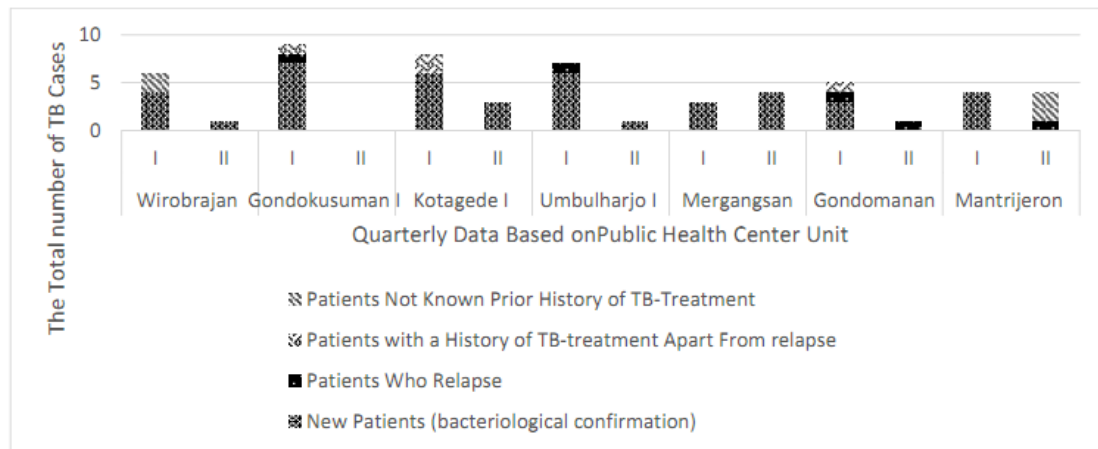


Figure 4. The Seven Highest TB Cases Data Based on Public Health Center for the Period January to June 2020

Based on the data Figure 4, the highest pulmonary TB cases were in the Kotagede I of Public health center and the lowest was found in the Gondomanan of public health center unit. The cumulative number of TB cases from the 7 (seven) health centers was 42 cases based on bacteriological confirmed data for TB patients. The fluctuation of data on bacteriologically confirmed New Pulmonary TB cases is very visible in the description of the quarterly data trend that has been presented both graphically and in table. During the pandemic, the trend of cases tends to decrease due to the lack of new visits and TB treatment. Even though during the Covid-19 pandemic, the continuity of Tuberculosis services must be pursued by ensuring services for TB patients and TB patients with resistance. Drugs or RO, both TB suspects and TB patients who are currently in the treatment stage should run without interruption and until they recover (Ministry of Health of the Republic of Indonesia, 2020).

Some of the challenges faced in the implementation of socialization and case finding screening activities during this online method pandemic, namely cadres are not too familiar with online mechanisms and prefer face-to-face activities with the community, constraints in operating social media and google forms, lack of community participation to fill in links online screening, limited pulse

quota, and limited care network. Regarding the referral and examination for tuberculosis, many of the people already have symptoms but refuse to go to the Public health center unit on the grounds that they feel healthy, enter the area with social distancing regulations, worry about contracting Covid-19 and personal safety when going to the Public health center unit, or restrictions from the examination over there (Ministry of Health of the Republic of Indonesia, 2020). TB patients must take action to be protected from COVID-19 and continue to treat TB as directed. Every TB patient will get a surgical mask that must be worn when the patient is in control of treatment and does highly important outside activities. TB patients are strongly advised to limit activities outside the households to avoid the possibility of being exposed to the SARS Cov-2 virus that causes COVID-19 (Pambudi, 2020). Identification of patients having a high risk becomes a reference in determining the choice of prevention, treatment and disease management strategy in formulating appropriate. The control method and efficient transmission approach should be taken to prevent disease transmission (Saifullah, et. al., 2021). COVID-19 has provided an opportunity to launching several form of adaptation TB care as a community approach, capacity building of human resources, and to combat the stigma that exists by multi-sectoral

approaches (Fatima, et. al., 2021).

Environment is one of the factors causing pulmonary TB incidence. The physical environment of the house is one of the environmental factors variables increases TB transmission. Based on Mahpudin's study, there was a relationship between the household environment and the incidence of TB. The healthy housing environment studied included room lighting, room ventilation, floor type, occupancy density, and household contact (Mahpudin & Mahkota, 2007). Based on data from the Yogyakarta City Health Office in 2018, the average coverage of healthy housing reached 96,29%. The healthy housing coverage according to public health centers data in Yogyakarta City in 2018 were listed in table 1.

The environmental factor also affects TB cases that covering the physical environment. Environmental conditions, especially healthy housing conditions also have a role in the spread of pulmonary TB bacteria to healthy people. The spread of pulmonary tuberculosis bacteria will attack healthy people more quickly if they are in a humid, less light and densely populated-house (Handriyo & Wulan,

2017). Environmental conditions playing a role in disease development were humidity and number of people living in the house. Housing densely populated and poor ventilation conditions increase the potential exposure to Mycobacterium tuberculosis (MTB) (Srivastava, et.al., 2015). Factors affecting the incidence of tuberculosis are related to the host and the environment. The study of tuberculosis can be started by identifying the number of family members per household, educational status, room area per person, history of contact with TB sufferers, availability and number of windows, location of kitchens in the house, and whether there are restrictions on contact with TB sufferers. People should build a house with a kitchen separate from the main living area, and add a ceiling and more than one window. In addition, smoking should be avoided indoors because this habit will contribute to the risk of TB transmission. Further research has also revealed that co-infection with human immunodeficiency viruses, worms, and malnutrition is important to control in TB prevention (Tesema et al., 2015)

Table 1. The Healthy Housing Coverages Data According to Public Health Centers in Yogyakarta City in 2018

Public health center	Total Households	A house that meets the requirements for a healthy housing	
		Total	%
Danurejan 1	1,571	1,521	96,82
Danurejan 2	2,456	2,165	88,15
Gondokusuman 1	5,353	5,344	99,83
Gondokusuman 2	2,297	2,242	97,61
Gondomanan	3,148	3,127	99,33
Gedongtengen	5,469	5,462	99,87
Jetis	5,559	4,931	88,70
Kotagede 1	3,809	3,788	99,45
Kotagede 2	3,447	2,867	83,17
Kraton	3,645	3,636	99,75
Mergangsan	5,967	5,960	99,88
Mantrijeron	8,167	7,731	94,66
Ngampilan	3,422	3,392	99,12
Pakualaman	3,028	3,027	99,97
Tegalrejo	6,271	5,860	93,45
Umbulharjo 1	10,652	10,616	99,96
Umbulharjo 2	4,516	4,514	99,96
Wirobrajan	4,381	3,891	88,82

The Trend Analysis of the Physical Environment For Healthy Households Indicators with TB Prevalence in the Yogyakarta City

Data on the healthy housing for the “non-healthy housing” category is obtained

from the difference between the 100% coverage of a healthy housing and the actual coverage of a healthy housing. If the “non-healthy housing” data is compared with the TB incidence (prevalence) data, the following graph will be showed (Figure 5):

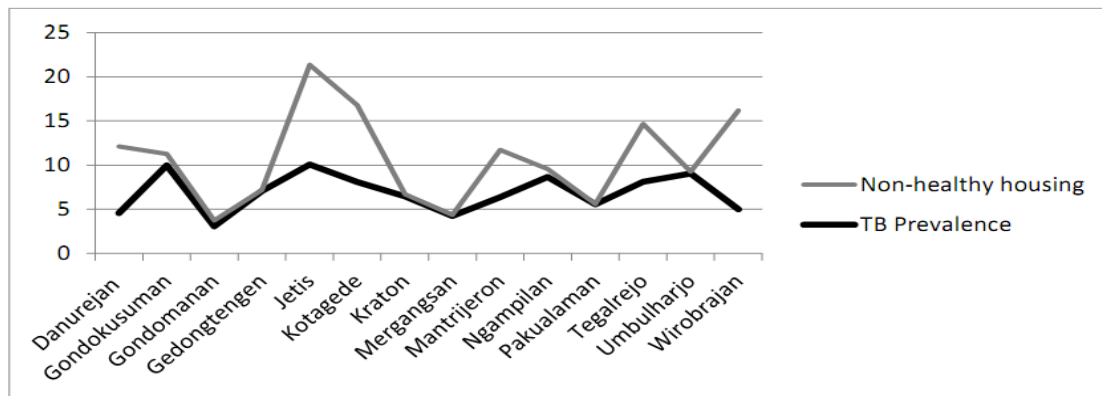


Figure 5. Graph of “Non-healthy Housing” and TB Prevalence-based Data Trends in Public Health Center in 2018

Based on the chart above, it can be seen that the trend of the data that the higher the number the house will not be healthy, because it will cause the higher the prevalence of their tuberculosis. This can be seen from the trend analysis in the chart above. When the number of unhealthy houses has decreased, the TB prevalence tends to fall and vice versa. This study examines the condition of the household environment with the incidence of TB in Yogyakarta City. The condition of the households environment is seen from secondary data on the number of non-healthy housing, where indicators of a healthy housing include building materials; components and house space arrangement; lighting; air quality; ventilation; infectious animals; water; available means of safe food storage; waste; and density of bed occupancy. Based on the results of the trend analysis, it was found that there was a possible relationship between non-healthy housing and the incidence of TB. The higher the number of non-healthy housing will impact to the higher the TB prevalence rate too. It can be seen from trend analysis chart carried out.

The results study were in line with other study which conducted by Sugandi et. al., (2018) that the healthy housing condition plays a role in the incidence of TB in Bandung as much as

73.75% of the population’s house condition in the good category. Each family who children exposed to TB cases actually caused by the lack of ventilation and lighting conditions in the house, besides that the inadequate house area is a trigger for the occurrence of TB cases in children. In addition to these factors, previous studies reported that there was a relationship between house occupancy density, ventilation, floor type, wall type, and household contact with a TB family with the incidence of pulmonary TB (Harfadhilah, et. al., 2013). Other studies contradict, only sunlight factor was associated with TB incidence. The factors of the presence of windows, windows opened every morning, room ventilation, lighting in the room, room humidity, and the presence of smokers in the house were not related to the incidence of TB (Musadad, 2006). Healthy housing and household phylogenic related to socio-demographic factors and the environment against the prevalence of pulmonary tuberculosis. It is expected that the Department of Health, community health centers and stakeholders can improve the prevention and control of pulmonary TB disease. A family-based approach is one of the right ways to reduce the risk of pulmonary tuberculosis so that it can increase the percentage of households with

healthy housing coverage and households with healthy behavior (Putri, et. al., 2019).

Healthy house indicators include building materials; components and house space arrangement; lighting; air quality; ventilation; infectious animals; water; available means of safe food storage; waste; and density of bed occupancy. The data obtained is the overall data, not the detailed data for each variable. Healthy household indicators that it can affect the incidence of TB include lighting, air quality, ventilation, and occupancy density; it can be a factor in the incidence of TB. There was a correlation between home environment factors and incidence of pulmonary TB transmission (Aditama, et. al., 2019). This study consistent with several previous studies, study on Muslim women which stated that temperature, humidity, and lighting were statistically proven to affect the incidence of TB, while ventilation, floors, walls, ceilings, and occupancy density were not statistically proven (Muslimah and Dwi, 2019). The associations between floor levels of residence and TB cases have been reported dependent on housing types because housing characteristics as main factor to explore an ecological study of the TB disease (Low et al., 2013). Another study stated that there was a significant relationship between occupancy density, humidity, ventilation area, and natural lighting with the incidence of pulmonary tuberculosis but there was no relationship between floor type and the incidence of pulmonary tuberculosis (Hamidah, et. al., 2015).

Direct natural lighting or sunlight can reduce the incidence of pulmonary tuberculosis transmission, because ultraviolet light from sunlight entering the house can kill TB germs. In other hand, housing environmental factors can increase the incidence of pulmonary TB include room ventilation, humidity, temperature, lighting, type of floor, and occupancy density (Duru et al., 2016). Then, relevant with other study that the risk of TB infection transmission was high in setting with increased number of person/room (OR=2,78), having tiny house (OR=4,25) poor ventilation system with less number of windows per room (OR=8,83) with p value of 0,0001. It was also reported that the risk of TB increased if the wall and floor of the

houses were built with mud/brick rather than cement (OR=2,50 and 1.89) with a significant p-value of 0.0001 (Khaliq, et. al., 2015).

Houses with less ventilation will affect the incidence of pulmonary tuberculosis. Household ventilation functions to remove polluted air (bacteria, CO₂) in the house and replace it with fresh and clean air or to circulate air where ultra violet light enters. In this study, ventilation was a risk factor associated with pulmonary tuberculosis. These results are consistent with previous study that there was a relationship between ventilation and the incidence of pulmonary tuberculosis. Residential density is one of the requirements for a healthy household according to the Ministry of Health of the Republic of Indonesia Number: 829 / Minister of Health / SK / VII / 1999. A household that has an occupancy density of > 9 m² meets the requirements for a healthy house. The density of occupancy is in one house, the greater the interaction that occurs between residents in the one house. The previous study only reported that people which living in crowded conditions were experience repeated and increase the TB infection for healthy people in the same house. Crowding was relationship both with risk of infection and risk of progression from infection to disease (Khan, 2016). The number of people per room was the only housing characteristic associated with progression to TB disease among infected participants, it caused by exposure to *M. tuberculosis* containing droplet particles during interactions in people's homes, it becomes making exchange rates within the range of values standard measured in air. The similar studies in New Zealand showed that TB incidence was associated with household crowding (Baker, et. al., 2008). The other study results were obtained from Low, et. al., (2013), reported that TB outcome could be characterized by dwelling characteristics such as housing type and height; they suggest that communities with poor household condition had a higher risk of TB. There were significant public health implications for Asian cities especially in high density urban living.

Environmental condition and host information related risk factors were very important to control the spread of infection

and disease (Khaliq, et. al., 2015). Household environmental conditions and indoor cleanliness are associated with the incidence of TB (Chen, et. al., 2021). Our study also shows credible results in the analysis of housing type by community. The actions needed to accelerate the reduction in the global burden of tuberculosis disease set for 2020, 2025, 2030 and 2035 consist of coverage in testing, case reporting, and overall access to health facilities, especially in developing countries, multi-sectoral efforts to reduce the prevalence of the major risks factor to disease infection and then increased investment in research and development (Floyd et al., 2018). The improvements in socio-environmental aspects are needed, but they must be combined with the improvement of education level (Cardoso, et. al., 2017). Thus, information regarding environmental and host risk factors is very important to control the spread of infection and disease (Khaliq, et. al., 2015).

Conclusion

The number of TB (BTA +) is increasing each year in terms of the distribution of data according to the focus of the study. The higher percentage of non-healthy housing coverage was associated in line with the higher the TB prevalence rate. It can be concluded that the physical environment factor of the house as an indicator of a healthy housing is closely related to the incidence of TB in Yogyakarta City. Environmental quality studies need to be carried out for comprehensive TB disease control towards elimination (End TB 2030) which is in line with national programs and SDGs goals.

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The Initiatives to Improve Antenatal Care Visits By Third-Trimester Pregnant Women

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Abstract

Low rate of pregnant women's visit can inhibit the information health workers need to collect, subsequently posing problem in providing health assistance. This is extremely dangerous for the safety of mother and baby during childbirth. Jember district health center reported low rate of visit of third-trimester pregnant women as evidenced by an average visit of below 4 times. The aim of the study was to increase the coverage of third-trimester pregnant women's visit based on community involvement based on factor analysis at Jember district health center. This study aims to increase the visit of trimester 3 pregnant women to public health centres. This research is an analytic research with cross sectional approach. The study involves 100 third-trimester pregnant women, chosen through random sampling. The results of this study highlight 6 independent variables that affect pregnant women visits. The most dominant influence is pregnant women's knowledge regarding visit ($p = 0.003 < 0.05$ Exp (B) 7.523, equal to 75%). There is a significant difference between the southern and northern parts of the Jember health center with regard to knowledge, socio-cultural, and geographical location. The priority issues determined from the Focus Group Discussion process are 1) the level of knowledge; 2) social culture; and 3) geographical location. The study demonstrates that the right measures are to conduct routine counseling related to the importance of ANC visits, evaluate the presence of ANC visits and add ball pick-up services for pregnant women who do not visit ANC.

Introduction

Public health center is a place for basic health services for community to handle various health problems. In addition, health centers also provide decent yet affordable health services to the community in order to improve community health status. Public health center serves a basic health service institution that provides complete public and private health services that provide in-patient, out-patient and referral services. Pregnancy is a continuous process of ovulation (release of eggs), spermatozoa and ovum growth, conception and growth of the zygote, uterine nidation, placental formation and the occurrence of fetal growth and development

in the uterus to delivery or term. In pregnancy there are physiological and psychological changes, so pregnant women need information or checks related to their pregnancy (Afulani et al., 2018).

ANC visit is a visit of pregnant women to health workers to check their pregnancy to optimize the physical and mental health of pregnant women. So that pregnant women are able to face childbirth, when childbirth, preparation for breastfeeding and the return of normal reproductive health (Afulani et al, 2019). Examination during childbirth, after the childbirth, preparation for breastfeeding and the return of normal reproductive health

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require serious attention (Afulani et al, 2019). Pregnancy examination is very important for and fetal growth and health of the mother.

According to the Indonesian Ministry of Health, the ANC examination is carried out by professional health workers such as obstetricians and general obstetricians, midwives and nurses in health services (Akowuah et al., 2018). ANC services can be obtained during Integrated Health Service Post by midwives, at the place of doctors or private practice midwives, at the maternity hospital and at the MCH clinic (Al-Shammari et al., 2018). ANC visits with a predetermined time are aimed at providing protection to pregnant women and the fetus as initial measure to diagnose risk factors, prevention and early treatment of pregnancy complications (Al-Shammari et al., 2018).

According to the Sumanti, 2015 ANC services at least four times during pregnancy. These involve at least once in the first trimester (K1), once in the second trimester (K2), and twice in the third trimester (K3 and K4) (Sumanti, 2015). According to the data from WHO, in 2016 only 64% women at world level receive four or more ANC services. To contrast, Southeast Asia is reported to mark only 57%, which is the lowest after the Eastern Mediterranean (Louis et al., 2016). National coverage for K1 and K4 according to the Ministry of Health Strategy Plan 2014 has set ANC Visit targets for K1 of 100% and K4 of 95% (Laksono et al., 2020). ANC coverage in Indonesia for K1 was 95.75% and that for K4 was 87.48% (Wulandari & Laksono, 2020). The lack of optimal ANC services results in low opportunities to capture and manage high obstetric risks (Wulandari & Laksono, 2020). According to WHO, pregnant women who do not receive ANC services are one of the causes of the high number of maternal mortality rates (MMR) and infant mortality rates (IMR) (Louis et al., 2016). WHO defines that maternal death is the death of a woman during pregnancy or 42 days after pregnancy. The death is made worse by pregnancy or health during her pregnancy (Louis et al., 2016). Around 500,000 pregnant women die each year in the world, 99% occur in developing countries (Louis et al., 2016).

Maternal Mortality Rate according to the Republic of Indonesia Ministry of Health in 2015 decreased by 305 maternal deaths per 100,000, after a significant increase in MMR in 2012 which was 359 maternal deaths per 100,000 live births, but the figure was still relatively high (Wulandari & Laksono, 2020).

Factors causing high MMR according to Wulandari & Laksono (2020), include; lack of knowledge about reproductive health and inadequate distribution of good midwifery services for pregnant women. Meanwhile, according to Dansereau et al. (2018), a low level of maternal education can cause a lack of maternal knowledge about health, including the importance of antenatal care. Likewise, pregnant women who do not receive education will result in a lack of knowledge about matters related to the pregnancy. According to research conducted by Latifah one of the causes of neonatal death is ANC visit less than 4 times or incomplete K4 visit in pregnant women. ANC services are one of the interventions to reduce maternal mortality, because ANC services are able to detect and handle cases of risk to pregnancy (Wulandari & Laksono, 2020).

Several factors influence the behavior of health service utilization, according to Eluwa et al. (2018). These are pertinent to predisposing factors including individual knowledge, attitudes, beliefs, personal choices, existing skills, and beliefs about self-efficacy, age, type sex, marital status, ethnicity, education and occupation. The reinforcing factor is manifested in the attitudes and behavior of health workers, husbands, or family, social support, peer influence or other people. The last factor pertains to enabling factors which include health service facilities, affordability, and information media (Da Costa et al., 2018).

Several preliminary studies conducted by researchers in health centers of Jember district report that the low number of visits by third-trimester pregnant women was proven by Health Center in Ledokombo, Sumberjambe, Jenggawah, and Rambipuji. These data report the average visit of third-trimester pregnant women, which is less than 4 times. According to the minimum health service standard in

2012 stipulated by the Ministry of Health of Indonesia, pregnant women during pregnancy requires at least 4 visits. These visits are distributed as follow: at least 1 visit in the first trimester, at least 1 visit trimester II, and at least 2 visits trimester III. Lack of coverage of pregnant women visit can cause lack of information received by health workers causing difficulty in providing assistance during delivery. This is very dangerous for the safety of mother and baby during childbirth.

Researchers aim to increase the visit of third trimester pregnant women by conducting studies related to the behavior of pregnant women. The present study is devoted to increasing the number of visits of pregnant women. Grounded within this objective, the present study is concerned with “The Initiatives to Improve The Antenatal Care Visits by Third-Trimester Pregnant Women in Public Health Center in Jember District”.

Method

This study used an analytic research design with a cross sectional approach, because this study was conducted on the independent variable and the dependent variable at the same time. The subjects of this study were all third trimester pregnant women in the Jember district health centers who met the following inclusion criteria: 1) third trimester pregnant women who reside and are registered as residents in Jember Regency; 2) being able to communicate well; 3) willing to be a respondent; 4) at the time of the research the respondents were in place. The location of this research is in public health center of Ledokombo, Sumberjambe, Jenggawah, Rambipuji in Jember Regency. The population in this study was all third trimester pregnant women who were in the Jember district health center. The average number of pregnant women from 2018 - 2019 is 2500

people. The number of samples used in this study was 100 respondents who were calculated using a formula:

$$n = \frac{N}{1 + Ne^2}$$

The sampling technique used is cluster sampling. Cluster Sampling (Area Sampling) is also cluster random sampling. This technique is used when the population does not consist of individuals, but consists of groups of individuals or clusters. Area sampling technique is used to determine the sample if the object to be studied or the data source is very broad. The number of respondents used in this study amounted to 100 people. so that later it will be divided per region or region. In northern Jember, 2 puskesmas were taken because of its large area, in the southern part of Jember, 2 Public Health center were taken because of its large area, in urban Jember, 1 Public Health center was taken because the area was not large. Each area of the Public Health center will take a sample of 20 people who meet the inclusion criteria.

Result and Discussion

This section focuses on the analysis of predisposing factors, enabling factors and reinforcing factors on the behavior of pregnant women. It begins with the identification of the dependent and dependent variables. The researchers also conducted a different test from four Public Health centers from two different regions. Focus Group Discussion (FGD) was subsequently conducted to increase the coverage of third-trimester pregnant women visits based on community involvement based on the results of a factor analysis at Jember district health center.

Table 1. Identification On Predisposing Factors, Enabling Factors And Reinforcing Factors On The Behavior Of Pregnant Women

	Pregnant Knowledge		Total
Antenatal Care Visit	0	1	
0	38	24	62
1	18	20	38
Total	56	44	100
	Pregnant Attitude		Total
Antenatal Care Visit	0	1	
0	42	20	62
1	14	24	38
Total	56	44	100
	Under Regional Minimum		Total
Antenatal Care Visit	0	1	
0	36	26	62
1	32	6	38
Total	68	32	100
	Infrastructures		Total
Antenatal Care Visit	0	1	
0	46	16	62
1	18	20	38
Total	64	36	100
	Sociocultural		Total
Antenatal Care Visit	0	1	
0	38	24	62
1	32	6	38
Total	70	30	100
	Geographical		Total
Antenatal Care Visit	0	1	
0	39	23	62
1	26	12	38
Total	65	35	100
	Attitude of health workers		Total
Antenatal Care Visit	0	1	
0	42	20	62
1	19	19	38
Total	61	39	100

Source: Primary data, 2020

Table captions:

0: the visit on irregular basis

1: the visit on regular basis

Based on table 1, 38 pregnant women with insufficient knowledge still make the visit on irregular basis. 24 pregnant women with good background knowledge make the visit on irregular basis. 18 pregnant women with poor background knowledge make the visit on regular basis. 20 pregnant women with good background knowledge make the visit on regular basis. Based on table 1 above, 42 pregnant women with poor attitude make the visit on irregular basis. 20 pregnant women

with good attitude make the visit on irregular basis. 14 pregnant women with poor attitude make the visit on regular basis. 24 pregnant women with good attitude make the visit on regular basis.

Based on table 1 above, 36 pregnant women under regional minimum wage make the visit on irregular basis. 26 pregnant women at over minimum regional wage make the visit on irregular basis. 32 pregnant women under regional minimum wage make the visit on

regular basis. 6 pregnant women at over regional minimum wage make the visit on regular basis. Based on table 1 above, it is found 46 pregnant women do not have decent infrastructure to allow them to make the visit. 16 women with good infrastructure make the visit on regular basis. 18 pregnant women with good infrastructure make the visit on regular basis. 20 pregnant women with good infrastructure make the visit on regular basis.

Based on table 1 above, conflicting socio-cultural setting causes 38 pregnant women to conduct an irregular pregnancy examination. Suitable sociocultural setting causes 24 pregnant mothers to make an irregular visit. Conflicting sociocultural setting causes 32 pregnant women to conduct regular visit. Suitable sociocultural setting causes 6 pregnant women to conduct regular visit. Based on table 1 above, un-strategic geographical location causes 39 pregnant women to conduct irregular visit. Strategic location causes 23 pregnant women to make irregular visit. Un-strategic location causes 26 pregnant women to conduct regular visits. Strategic location causes 12 pregnant women to make regular visit. Based on table 1 above, the poor attitude of health workers causes 42 pregnant women to make irregular visits. Good attitude of health workers causes 20 pregnant women to make irregular visits. The poor attitude of health workers causes 19 pregnant women to make regular visits. The good attitude of health workers causes 19 pregnant women to make regular visits.

Table 2. The Bivariate Analysis On The Behavior Of Pregnant Women

Antenatal Care Visit	Sig.
Pregnant Knowledge	.001
Pregnant Attitude	.009
Under Regional Minimum	.011
Infrastructure	.013
Sociocultural	.001
Geographical	.780
Attitude of health workers	.015

Source: Primary data, 2020

The table above demonstrates that pregnant women's knowledge is related to their visit, as evidenced by $p < 0.001 < 0.05$. This means that H1 is accepted. The results of this study

are in line with Simbolon's research in 2020, concerning the relationship between pregnant women's knowledge and their regular antenatal care at Public Health Center of Dalu Sepuluh in 2019 (Simbolon & Wahyuni, 2020). The study corroborates the correlation between K4 Visit of pregnant women and their knowledge. Previous works and the research findings contend that their knowledge about antenatal care visits is deemed pivotal to build their understanding so that they actively carry out antenatal care visits according as scheduled by health workers.

Based on the table above, the pregnant women's attitude is related to the visit of pregnant women as evidenced by $p < 0.009 < 0.05$, which means that H1 is accepted. The results of this study are in congruence with findings by Kabanga et al., (2019) and Patel et al. (2016), these studies point out that pregnant women's attitude is related to their level of knowledge, which serves as the driving factor to their attitude in conducting antenatal care visits. The higher knowledge level of pregnant women is, the better their attitude toward and diligence in the antenatal care visits. The table above shows that the minimum wage is related to the visit of pregnant women, as corroborated $p < 0.01 < 0.05$ significance. This confirms that H1 is accepted. These results support the findings in Abraham's research in 2018 in that both works corroborate the correlation between family's economic level and pregnant women's knowledge. This correlation influences pregnant women's attitude in making antenatal care visits. Better economic level results in better attitude toward and diligence in the visits (Abraham et al., 2018)

The table above shows that infrastructure holds strong relation with the visit of pregnant women as evidenced $p < 0.013 < 0.05$ significance, which confirms that H1 is accepted. The results of this study are in line with Bergen's research in 2019. His study acknowledges that antenatal care visits is strongly related to infrastructure in that public facilities support various community activities in everyday life. The better the public infrastructure is, the better the trust and motivation for the community to come to these places to obtain health services. The table above indicates that sociocultural circumstance is related to the visit of pregnant women, which is evidenced by $p < 0.001 < 0.05$, implying that

H1 is accepted. These findings are in line with Bwalya's study (2018), which confirms that sociocultural background is related to antenatal care visits. Social motive is something mutually connecting humans (Bwalya et al., 2018; Tamaka, 2013; Ulfah et al., 2019). Culture is something related to the codes of certain groups within their habits, which include beliefs and traditions in an environment. Sociocultural background is closely related to the success rate of antenatal care visits because sociocultural property is extremely influential on pregnant women's attitudes and behavior in conducting antenatal care visits.

Based on the table above, geographical background is not related to pregnant women's visit as evidenced by $p = 0.780 > 0.05$, which means that H1 is turned down. In congruence, the results of this study support Haruna (2018), both of which contend that geographical properties are not related to antenatal care visits. Geographical circumstance relates to the actual location of an area in relation to other places. Like Indonesia, every public health service has unique geographical properties. These days, geographical location is no longer a challenge to pregnant women for making antenatal care visit. It is fundamentally similar to the massive use of Android mobile technology. Everything you want can be found on an Android mobile phone through an online service application (shuttle service for people, goods, and food). The knowledge about the importance of making antenatal care visits can also be obtained on an android phone. This explains why the geographical variable is not related to antenatal care visits.

In this regard, our findings demonstrate that pregnant women's attitude of health workers is related to their visit. This has been evinced by $p = 0.015 < 0.05$, which implies that H1 is accepted. The results of this study are in line with Noviana's research in 2020. Both works highlight that health workers' attitude is related to antenatal care visits (Noviana, 2020). Health workers' attitude substantially affects the satisfaction of antenatal care visits. If pregnant women feel satisfied with the antenatal care services provided by health workers, trust will develop so that they are willing to make antenatal care visits on regular basis.

Table 3. The Multivariate Analysis On The Behavior of Pregnant Women

Number of visits by pregnant women	Sig.	Exp(B)
Pregnant Knowledge	.003	7.523
Pregnant Attitude	.002	6.640
Under Regional Minimum	.001	.080
Infrastructure	.013	4.983
Sociocultural	.000	.039
Geographical	.620	.711
Attitude of health workers	.034	4.829

Source: Primary data, 2020

There are 6 independent variables which affect pregnant women. The biggest influence is knowledge of pregnant women visit ($p = 0.003 < 0.05$ Exp (B) 7.523 equal to 75%). The results of this study are in accordance with Sumanti (2015), who contend that in Manganitu Health Center in Sangihe District there was a relationship between the knowledge of pregnant women and the frequency of visits as evidenced by the results of the Pearson product moment test obtained ($p = 0.847 > 0.345$). According Kaswa et al (2018), knowledge of pregnant women is strongly correlated with antenatal care (ANC) visits at the supporting Community Health Center in Malalayang sub-district of Manado ($p = 0.031 < 0.05$). The results of this study are consistent with the results of the study above, reporting that pregnant mother's knowledge influences the ANC visit. Simply put, the higher the pregnant woman's level of knowledge about ANC, the more regular ANC visit will be. Pregnant woman need to improve their knowledge of ANC visits to ensure their own and baby's health. In addition, that will reduce the rate of mother and baby's death (Kim et al., 2018; Mira, 2014).

Table 4. The One-Sample Test Results at Public Health Centers

	Sig. (2-tailed)	Mean Difference
Sumbersari health center (Northern)	.003	.320
Ledokombo health center (Northern)	.000	.440
Jenggawah health center (Southern)	.003	.320
Rambipuji health center (Southern)	.000	.440

Source: Primary data, 2020

Based on table 9, the test results marked a significant difference between the health centers in the northern regions of Sumber Jambe ($p\ 0.003 < 0.05$) and the health center in Ledokombo ($p\ 0.000 < 0.05$). Those in southern area, Jenggawah and Rambipuji, are also found to have the same results, ($p\ 0.003 < 0.05$) and ($p\ 0.000 < 0.05$), respectively. There are significant differences between these groups of health centers. Health centers in the southern part tend to be associated with higher level of knowledge, better socio-cultural background and geographical location due to better educational background and easier access to information (Laksono et al., 2020). What is more, the people are more receptive to input. In terms of, geographical location, the health services in the southern part are spread evenly and are close to one another. The transportation access road to these centers are flat and easy to pass by public, meaning more safety for pregnant conditions (Vika, 2015; Haruna-Ogun, 2018). By contrast, in the northern part of Jember, the women have lower level of knowledge due to lower educational background and difficulty to access information concerning the importance of ANC visits (Kim et al., 2018). The social culture is strongly influential in that it has substantially influenced the ANC visit of pregnant women. This social culture also influences the attitudes and behavior of pregnant women in conducting ANC visits. The geographical location of health services in the northern part has been evenly distributed, but the road conditions are quite varied with uphill and downhill, which is characterized by mountainous areas which. This has led to lower number of visit by pregnant women in the northern area. The attitude of health care workers in northern Jember should be further improved so that services can attract the attention of pregnant women and increase their visits for checking their pregnancy (Akouwah, 2018; Gita, 2015).

Focus Group Discussion (FGD) as Initiative to Increase The Coverage of Third-Trimester Pregnant Women Based on Public Involvement by Pondering Factors Affecting Public Health Centres in Jember. The researchers conducted Focus Group Discussion (FGD) after analyzing the research data. From the results of the study, knowledge, attitudes,

economic background, infrastructure, socio-cultural setting, and behavior of pregnant women significantly influence ANC visits. The test results proved that there were differences between the public health centers in the northern part and southern part of Jember. These differences pertain to the level of knowledge, social culture and geographical location of health services.

Also, the level of knowledge, socio-cultural background, and geographical location of health services require immediate solution, particularly due to lower rate of visits in the southern part. Based on the findings, the researchers sought to increase ANC visits by conducting FGDs with the public health centers and emphasizing the three important things to be resolved. However, the FGD participants took voting, which results in the following priority 1) level of knowledge; 2) sociocultural setting; 3) geographical location. Based on the voting results, the researchers formulated a solution for low level of knowledge, which is to conduct consultation on regular basis. This is expected to help pregnant women understand the importance of examining mother and her fetus' health. For socio-cultural problems, one particular approach is to encourage pregnant women to uphold the local wisdom of each region. Some of the examples are egg arisan, providing green bean drinks and good food for pregnant women. To address issues concerning geographical location, the solution is to make roomy visits to several houses of residents living in inaccessible areas.

Conclusion

There are 6 independent variables which affect pregnant women. The biggest influence is knowledge of pregnant women visit ($p = 0.003 < 0.05$ Exp (B) 7.523 equal to 75%). There is a significant difference between health centers in the southern part and northern part of Jember, with regard to knowledge, socio-cultural setting, and geographical location. The priority issues determined from the FGD process are 1) the level of knowledge; 2) sociocultural setting; 3) geographical location. The researcher's suggestion is to conduct regular counseling related to the importance of ANC visits for pregnant women, evaluate the presence of ANC

visits through proactive services for pregnant women who do not visit ANC.

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The Instrumentation of Standard Diet Food Portions for Diabetes Mellitus

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Abstract

The right diet is needed in the treatment of Diabetes Mellitus. The dietary standards used must be by their nutritional adequacy. This study aims to determine the effectiveness of the use of aluminum cup serving tools for standard measuring devices in the Diabetes mellitus diet. The portion measurement instrument is designed by 1P, 1 1 / 2P, and 2P standards. The study was conducted at a laboratory scale in 2018 with a quasi-experimental approach. Data analysis uses Analysis of Variance (ANOVA) with $\alpha = 5\%$. The results show that the average effectiveness of 1P portion accuracy is 99%, 1½ P for 101%, and 2P about 99.6%. There was no difference in effectiveness compared to using a scale and there were differences in measurements using bowls and spoons. Standard portion of 1P measuring instruments 114% effectiveness bowl and 113% spoon, standard 1½ P portion for 107% bowl and 105% spoon, and 2P standard portion for measuring the effectiveness of the portion of the bowl is 104% and 103% spoon. Using a measuring device Aluminum cup portions, both 1P, 1.5P, and 2P parts can determine the value of food and nutritional adequacy standards of patients with Diabetes Mellitus.

Introduction

Compliance of Diabetes patients toward nutritional principles and food planning is important for maintaining health status (Yuliasuti et al., 2019; García-Pérez et al., 2013). Nutritional therapy is a major component of the successful management of Diabetes mellitus. Based on the recommendations of the American Diabetes Association (ADA), medical, nutrition, and therapy requires a comprehensive approach, including doctors, dietitian, nurses, other health workers, and patients. That aims to improve the ability of each patient to achieve good metabolic control (Morris & Wylie-Rosett, 2010). For those digitizers as implementers of nutrition management, especially in hospitals, so that a healthy diet through balanced nutrition for patients is fulfilled, it is very important to set standards for food portions. The standard food portions set for people with Diabetes mellitus must comply with nutritional adequacy

standards (López-gamiño et al., 2012). Therefore, a standard measurement of food portions that are accurate, fast and appropriate is needed so that the patient's nutritional adequacy is met.

Specifically for implementing a healthy diet with balanced nutrition for people with Diabetes mellitus who are either outpatient or hospitalized to fulfill their nutritional requirements, it is recommended to fulfill adequacy, such as carbohydrate needs are <130 gr/ day (Morris & Wylie-Rosett 2010), normal protein requirements, 15-20% of energy requirements (López-gamiño et al., 2012), fat requirements, about 7% of total energy needs (Mihardja et al., 2014), fiber intake is recommended as much as 20-35 gr/1000 kcals (Folorunso & Oguntibeju, 2013). In managing a healthy diet with balanced nutrition, there are recommended dietary standards in the exchange unit of the portion (P), for example for people with Diabetes mellitus with normal body weight energy requirements of 1900

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kcal/day. Diabetics with a body weight of less than 2300 kcal. Whereas sufferers with more weight need 1300 kcal/day while sufferers with vegetarian behavior need the energy of 1600 k.kal (Jain et al., 2014).

To make it easier to get food, the menu is compiled based on a list of food exchanges (P). Food needs to meet their energy needs, expressed in units of exchange (non-standard), especially for carbohydrates such as rice, for example, 1 cup of rice about 0.5 kg, then for 1.5 glasses of 0.75 kg (Oseni et al., 2017; Mulligan et al., 2014). Diabetes mellitus patients with normal body weight with energy requirements of 1900 kcal/day. Energy requirements derived from carbohydrate sources are given morning, afternoon and evening, which amounts to around 400 gr. The number of carbohydrate needs is determined using the unit of a food exchange, for example, 1p, 1 1/2P and 2P.

If in one day energy needs for patients with Diabetes mellitus with normal weight need 4P carbohydrate intake (morning 1P, afternoon 1 1/2P and afternoon 1 1/2P) with a staple food source of rice, then sharing a daily meal is to eat breakfast needs about 100 gr of rice, noon 150 grand at night 150 gr. For that to achieve and maintain a normal Western Body, a healthy diet with balanced nutrition is very important for people with diabetes. The need for rice food is good for outpatient care and hospitalization (Oseni et al., 2017; Mulligan et al., 2014). For patients with Diabetes or other diseases in hospitals, nutrition management is not difficult, if they follow the standard food portions that have been set especially for staple foods.

Several studies have shown that there was an advantage if a precise and accurate portion of the patient is determined, namely improving nutritional status, speeding up the healing process, reducing care days and being efficient for costs lost due to leftovers (Kasper et al., 2016; Drewnowski & Darmon, 2005). Nutrition Installation as an organizer of nutrition service activities in hospitals both inpatient and outpatient care needs to make accurate measuring instruments so that the patient's nutritional adequacy is fulfilled. For this reason, researchers are interested in conducting research, the Effectiveness of

Measuring Tool of Aluminum Cup's Portion toward a Standard of the Food Portion on Dietary of Diabetes Mellitus in Pontianak, West Kalimantan, Indonesia.

Method

This type of research is a quasi-experimental, with times series with control design. The research was conducted in April-August 2018 and carried out at the Food Laboratory of the Department of Nutrition, Health Polytechnic of Health Ministry of Pontianak, West Kalimantan. The number of food portion measurement tools is three treatments, namely: (1) plastic tool bowl, (2) stainless steel spoon, and (3) aluminum cup's portion. The portion measuring instrument is used to determine 1P, 1½P and 2P portions, as many as 90 samples, with sampling techniques determined by simple random sampling.

Data collected by the accuracy of portion sizes is done by filling the food portion measuring instrument. Portion measuring instruments are Stainless Steel Spoon' and Plastic Bowl 'portion, commonly used in hospitals, and the Aluminum Cup port tool. Data on the size of the staple food are then weighed. To determine the accuracy of food portion sizes, it's determined by comparing the results of the weighing with measuring instruments and the standard portion of the Diabetes diet. The standard portion of P1 is 100 gr, 1½P is 150 gr and 2P is 200 gr. Data that has been collected is processed by a computer program. Processed data is presented with tables, graphs and textual. Data analysis used the ANOVA statistical test, with $\alpha = 5\%$.

Result and Discussion

Determination of the standard measure of the portion of rice for Diabetes patients was made three standards, namely 1P (100 g), 1½P (150 g) and standard 2P (200 g). Each standard is determined by measuring instrument of a digital scale, aluminum cup, plastic bowl and stainless steel spoon.

In table 1 it's known that the standard of one portion (1P) in Diabetes patients is measured using a portion of rice measure, namely digital scales, plastic bowls and stainless steel spoons. The results showed that measuring

food portions with 100 gr digital scales is almost the same as aluminum cups which are 99.3 gr. This measurement is more accurate than the plastic bowl for 114.1 gr and with a stainless steel rice spoon 112.9 g.

Table 1. Difference between Measuring Instruments of 100 Gram Rice Portion (1P) For Diabetes Mellitus Patients

Replications	Measuring instruments (gram)			
	Digital Scales	Aluminium Cups	Plastic Bowls	Stainless Steel Spoons
1	100	101	120	127
2	100	97	106	121
3	100	98	101	123
4	100	102	117	100
5	100	100	109	109
6	100	97	120	104
7	100	101	118	115
8	100	98	119	104
9	100	100	116	109
10	100	99	115	117
Total	1000	993	1141	1129
Average	100	99,3	114,1	112,9

Source: primary data, 2018

Statistical analysis using the Kruskal Wallis test showed that there was a significant difference between the digital scales (control) and the manual food portion measuring instrument ($p \leq 0.001$). There is no difference in the determination of rice portion measuring instruments using digital standard scales with measuring devices for aluminum cups ($p = 0.48$). There is a significant difference between the determination of food portion measuring instruments using digital scales with plastic

bowls ($p \leq 0.001$) and stainless steel rice spoons ($p \leq 0.001$). There is a difference between aluminum rice cups with plastic bowls ($p \leq 0.001$) and stainless steel spoons ($p \leq 0.001$). There is no standard difference in food portions using plastic bowls with stainless steel spoons ($p = 0.79$). The standard determination of the portion of rice using a digital scale has almost the same accuracy as a measuring instrument for aluminum cups and is more appropriate than a plastic bowl and stainless steel spoon.

Table 2 Measuring Instrument of Food Portion 150 g. (1½P) For Diabetes Mellitus

Replications	Measuring Instrument (gram)			
	Digital Scales	Aluminium Cups	Plastic Bowls	Stainless- Steel Spoons
1	150	150	160	165
2	150	152	150	155
3	150	150	158	151
4	150	152	158	155
5	150	153	160	147
6	150	149	166	155
7	150	152	153	162
8	150	150	169	160
9	150	152	164	165
10	150	151	159	165
Total	1500	1511	1597	1580
Average	150	151,1	159,7	158

Source: primary data, 2018

In table 2 it's known that the determination of the average standard of rice food portions 150 gr (1½ P) for Diabetes patients using a digital scale of 150 gr. This result is almost the same as measuring instrument of aluminum cups for 151 gr. Measuring with aluminum cups is more accurate than using a portion measuring instrument with a plastic bowl of 159.7 gr and with 158 gr. stainless steel rice spoons. Statistical analysis using the Kruskal Wallis test showed that there was a significant difference between the determination of the standard portion of rice with a digital scale (control) and other treatments ($p \leq 0.001$). Analysis by the Mann-Whitney test, there was no significant difference in the determination of the portion of rice using digital scales with the aluminum cups portion tool ($p = 0.28$). There was a significant difference between determining food portions using digital scales with plastic bowls ($p \leq 0.001$) and stainless steel rice spoons ($p \leq 0.001$). There was a difference between an aluminum cups measuring with a plastic bowl ($p = 0.00$) and a stainless steel

rice spoon ($p \leq 0.001$). There was no difference in the determination of the average standard portion of rice 150 gr between using plastic bowls and a stainless steel spoons ($p = 0.68$).

The standard determination of food portions using a measuring instrument weighing has almost the same effectiveness as an aluminum cups food portion and it's more accurate than stainless steel spoons and plastic bowls food portion measuring instrument. Determination of the portion of rice using a plastic bowl measuring instrument and a stainless steel rice spoon is ineffective or does not meet the requirements for determining the standard portion of 150 g rice for people with diabetes. In table 3 shows that the determination of the average standard portion of rice (2P) is 200 gr in patients with Diabetes Mellitus using a scale of 200 g is almost the same as measuring cylinders of aluminum rice portion of 199.2 gr, but smaller than the measuring instrument portion a plastic bowl of 207.8 gr and a stainless steel rice spoon of 206.7 gr.

Table 3. Measuring Instrument of Food Portion 200 gr. (2P) for Diabetes Mellitus Patients

Replications	Digital Scales	Measuring Instrument (gram)		
		Alumunium Cups	Plastic Bowls	Stainless Steel Spoons
1	200	200	212	206
2	200	197	200	208
3	200	198	197	219
4	200	199	216	203
5	200	200	210	200
6	200	197	202	216
7	200	198	209	192
8	200	200	212	211
9	200	201	216	205
10	200	202	204	207
Total	2000	1992	2078	2067
Avarage	200	199,2	207,8	206,7

Source: primary data, 2018

Statistical analysis using the Kruskal Wallis test showed that there was a significant difference between the standard measurements of the portion of rice with a digital scale (control) and other treatments ($p = 0.00$). The analysis with the Mann-Whitney test revealed that there was no significant difference between the determination of the portion of the rice

measure using the scales with the measuring instrument of aluminum cups ($p = 0.28$). There was a significant difference between the dosing of food portions using a scale with a plastic bowl ($p \leq 0.001$) and a Stainless Steel rice spoon ($p \leq 0.001$). There is a significant difference between the aluminum portion measuring cups with plastic cups ($p \leq 0.001$) and stainless steel rice

spoons ($p \leq 0.001$). There was no difference in the standard measurement of 200 gr food portions between using a plastic bowl with a stainless steel spoon ($p = 0.74$). Measuring the standard 200 gr food portion (2P) using a digital scale measuring instrument has almost the same effectiveness as an aluminum cups food measuring instrument and is more appropriate than a plastic bowl rice measuring instrument and a stainless steel spoon. Determination of food portions using a plastic bowl measuring instrument and stainless steel rice spoon is inaccurate or does not meet the requirements for standard dosing of 200 gr food portions. for Diabetes patients.

Healing of Diabetes patient requires to adopt a healthy lifestyle. The goal of sufferers of healthy living behavior, diet or diet is to control blood sugar levels and prevent long-term complications that can be caused by diabetes. An unhealthy/inappropriate diet can have a risk of diabetes mellitus compared to a healthy diet. For this reason, to control the stability of blood sugar, among those that can be done by people with Diabetes Mellitus is to pay attention to diet (Glauber & Karnieli, 2013).

Setting the right diet is very important for people with Diabetes Mellitus. Setting a healthy or proper diet for people with diabetes, which is recommended for example contains complete nutrition, low fat and low calorie or contains enough calories (Folorunso & Oguntibeju, 2013). Regulating Diabetes diet, for example, sufferers who are too fat energy it takes around 1300 cal., carbohydrate needs (such as rice) 192 g, 45 g protein, and fat requirements 35 g. Carbohydrate Counting for Diabetes Mellitus patients with insulin therapy uses Algorithm, the optimal value of serving carbohydrates can be known, the amount of energy and dose of macronutrients needed within the tolerance limit (Jia et al., 2014; Chiesa et al., 2005). To meet the low-calorie recommendations with the optimal carbohydrate and energy values, one of them is needed the accurate portion of rice (Tascini et al., 2018). The right amount of food/rice is very much determined by the use of accurate food portions. The large portion of food that meets the recommended low calorie with the right dosage tool will be crucial for preventing long-term complications for people

with diabetes (Glauber & Karnieli, 2013; Martin et al., 2005).

The right of portion measuring tool is certainly done by weighing. Accurate food scales will determine the right amount of food intake (Martin et al., 2005; Tascini et al., 2018; Ullah et al., 2016). The use of a digital scale measuring instrument can determine the portion of food with optimal accuracy. Standard food portion measuring instruments with digital scales have high accuracy (Asif, 2014). However, it is difficult to do, if patients are served a lot and require fast service time, and patients are used in the household. In addition, this tool must be done with great care. In addition, this tool is expensive and not all people with Diabetes can afford the tool. In addition, how to operate it is must be trained. For this reason, it is necessary to make a food measuring instrument that has accuracy at the level of a digital scale but is easy to use and affordable.

In addition to testing a portion measuring instrument made of aluminum cups, a portion of rice with a plastic bowl and stainless steel rice spoon is also used. The results showed that plastic bowls and stainless steel spoons measuring tool device averaged a larger portion of rice. The use of the rice measuring tool with plastic bowls and stainless steel spoons is less effective than the standard rice portion measuring instrument, which is a digital scale from aluminum cups. The effectiveness of the use of plastic bowls and stainless steel spoon measuring device from the determination of the portion of rice is not different; the accuracy is between 103% - 114%, both for 1P, 1½P, and 2P. For this reason, it is necessary to create an appropriate tool, with material that is easily available, cheap and easy to make and can be ordered or purchased quickly, for example, in making aluminum cookware. The results of the study showed that the food/rice portion measuring instrument had high effectiveness, between 99-101%. For a standard portion of 100 g of rice (1P), a portion measuring tool is made in the form of a cylinder/aluminum with aluminum with a diameter of 6 cm and a rib height of 3.6 cm, average effectiveness of the portion of rice 99%, 1½ P 101% and 2P 99.6%, when compared with the measurement of the portion of the scale of digital (control portion)

the results were not significantly different.

The aluminum cups measuring instrument has the accuracy to measure the portion of rice for people with Diabetes mellitus. While measuring a portion of rice from plastic bowls and stainless steel spoons, the result is that the amount of rice is larger than using a digital scale and aluminum cups. For standard 1P portions using a measuring tool of rice from an effectiveness plastic bowl of 114% and stainless steel spoons of 113%. The standard portion of 1½ P effectiveness of a plastic bowl was 107% and stainless steel spoons were 105%. A standard portion of 2P rice effective portion size accuracy using plastic bowls 104% and stainless steel spoons were 103%. Similar research on the accuracy of the portion of food and intake of food is determined by estimating visual and digital methods. As a result, with an accurate portion of the appliance, the estimated portion of food is the more appropriate the amount of food intake (Rolls, 2014).

The right intake of food is important for maintaining blood glucose stability in people with diabetes (Asif, 2014; Jia et al., 2014; Fang et al., 2020). For this reason, in addition to the use of digital scales, the use of portion measuring instruments has accuracy, is cheap and easy to make. The instrument was a manual portion measuring tool made of aluminum in the form of cups. Aluminum cups have a high measurement for 1P, 1½P, and 2P portion sizes, with effectiveness between 99% - 101%, compared to plastic bowls and stainless steel rice spoons. With this effectiveness, the measuring tool of aluminum cups can be considered for use to determine the size of the rice portion of Diabetes mellitus patient (Asif, 2014; Jia et al., 2014; Martin et al., 2005).

Conclusion

The rice portion measuring instrument of aluminum cups has high effectiveness, between 99-101%. The average effectiveness of the portion of rice 1P is 99%, 1½ P 101% and 2P is 99.6%, compared to the measurement of the portion of digital scales (standard of food portions) the result is no difference in effectiveness for measuring rice portions for people with Diabetes Mellitus. The amount of 1P food portion uses rice measuring instrument

from effectiveness plastic bowls of 114% and stainless steel spoons of 113%, the standard portion of 1½ P effectiveness of a bowl of 107% and a stainless steel spoon of 105%.

As for the standard portion of 2P rice, the effectiveness of its portion size uses a plastic bowl of 104% and stainless steel spoon for 103%. Measuring the right portion of food/ rice, it's important to maintain blood glucose stability in people with Diabetes Mellitus. For that, in addition to the use of digital food scales, the use of aluminum design made in the form of the cup, both for 1P, 1½P and 2P portion sizes with the effectiveness of 99% - 101% can be considered to determine the size of food portions of Diabetes Mellitus patients.

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Identifying Risk Factors of Speech and Language Delay on Children

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Abstract

Speech and language delay are usually found in various disorders such as mental retardation, hearing impairment, psychosocial, autism, receptive aphasia and cerebral palsy and speech organ disorders. Retrospective research at Dr. Kariadi Hospital found that children aged 13 months to 60 months with complaints of speech problems that were subjected to an objective audiometric examination showed that 79.1% had hearing loss. This research aims to determine the relationship of risk factors with speech and language delays in children. This research was conducted in April 2020 using the cross-sectional with suspicion of late speaking who were examined by Brain evoked response audiometry (BERA) at Dr Kariadi Hospital Semarang. Researchers assessed the delay with the Language evaluation Scale Trivandum (LEST) questionnaire. Researchers analyzed the data with chi-square test, fisher's exact. The sample was 80 patients with the mean age was 22.35 months. Mostly in men (67.5%). The most common risk factor was hearing impairment. Hearing impairment was associated with speech and language delay. Economic status and bilingual were not associated with speech and language delay in children.

Introduction

Language is a means of communication that symbolizes thoughts and feelings to convey meaning to others, and its development occurs in a very sequential manner. Language is divided into 2 components, the first is receptive language which means understanding and the second is expressive language which means speaking. There is a fundamental difference between speech and language. Speech is a pronunciation that shows a person's skill in pronouncing the sound in a word. Language means expressing and receiving information in a certain way. Speech delay is a complaint that is often encountered in daily practice. This disorder seems to be increasing day by day, (Ankale et al. 2018), (Singraiah et al. 2017).

Retrospective Research in 2006 at the Central General Hospital (RSUP) Dr. In the Ear Nose Throat polyclinic, Head and Neck Surgery (ENT-KL) found children aged 13 months to 60 months with complaints of speech disturbances

who underwent an objective audiometric examination and the results were 20.9% normal and 79.1% Hearing Loss (KP). Meanwhile, in a 2018 study at Dr Kariadi Hospital, Semarang, children with congenital deafness were detected at the ENT-KL clinic according to medical record data on average 10-20 patients per month. The prevalence of speech and language delays was high (27%) in children less than three years of age in a 2016 study at the Hospital of Jawarharlal Institute education research Puducherry India., (Hartanto et al. 2016), (Mondal et al. 2016), (Sidiarto 2002).

Delays in speech and language development sometimes accompany various disorders such as mental retardation, hearing loss, an expressive language disorder, psychosocial, autism, receptive aphasia and cerebral palsy, it can also be due to delays in maturation or bilingualism. Speech and language development is one indicator of the overall development of children's cognitive

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abilities, affecting personal social life, causing learning and working difficulties. Early identification and intervention can prevent these disturbances and barriers from occurring, (Nelson et al. 2006),(Sandler et al. 2001).

The identification of speech and language delay is using the Language evaluation Scale Trivandum (LEST) developed by the Child Development Center. LEST is a simple valid tool to identify children 0-3 years with speech and language delays in the community. LEST consists of thirty-three items, (Ganavi et al. 2015), (Mondal et al. 2016). The objective examination of hearing used the Brainstem Evoked Response Audiometry (BERA) examination which can estimate the hearing threshold in children and uncooperative patients and is able to detect neurological abnormalities from the brain nerves to the VIII cranial nerve (auditory nerve) and brain stem. (Sunderajan & Kanhere 2019),(Tegnoor & Naaz 2019). The purpose of this study was to determine the relationship between risk factors and speech and language delays in children.

Method

This study used a cross-sectional method with a target sample of children who were suspected of being late in speech and a BERA examination was carried out at Dr. RSUP. Kariadi Semarang. The sample is determined by each group by calculating the formula based on previous studies, the proportion is 0.27 then with $Z_{\alpha} = 1,96$ and the degree of deviation from the desired population is 10%, the result is 76 and rounded up to 80. The sampling technique in this study was carried out by consecutive sampling, in this method each subject that met the research criteria was used as a research subject until the number of samples was met. The inclusion criteria for children aged 6 months - 36 months and exclusion criteria were children with central disorders such as mental retardation, cerebral palsy, aphasia, microcephaly, hydrocephalus and abnormalities of speech and language organs. Researchers conducted alloan amnesis to the sample for filling in the basic data and the LEST questionnaire, this questionnaire has been validated. LEST assessment is in 4 ways, namely Normal: All can answer questions.

Questionable : One point the question cannot be answered, Suspect: Two points cannot be answered, Delay: Three or more cannot answer the question. Based on the LEST score, the researchers concluded that speech and language delay if the LEST score is above 2 (Three points or more cannot answer), it is not too late to speak if the LEST score is less than 2 (One or two question points cannot be answered). Researchers analyzed several risk factors, namely hearing loss (result of ABR hearing threshold >40db in 1 or 2 ears), economic status and bilingualism. The ethical clearance was obtained from the Research Ethics Commission of RSUP Dr. Kariadi Semarang. Next, Researchers analyzed the data using the test Chi-square and fisher's exact, significant if $p < 0,05$.

Results and Discussion

The research respondents were 80 people with an average age of 22-35 months.

Table 1. Sample Characteristics

Variable	F	%
Gender		
Male	54	67,5
Female	26	32,5
Father's education		
Junior high school	9	17,0
Senior high school	31	38,8
Diploma	7	8,8
Bachelor	33	41,3
Mother's education		
Elementary	1	1,3
Junior high school	9	11,3
Senior high school	39	48,8
Diploma	6	7,5
Bachelor	25	31,3
Economic status		
Less	9	11,3
Enough	71	88,8
Bilingual		
≥ 2 languages	59	73,8
1 language	21	26,3
Hearing Loss		
No	46	57,5
Yes	34	42,5
LEST		
speech delay	56	70
Un-speech delay	24	30

Source: primary data, 2021

Table 2. Relationship Between Hearing Loss, Economic Status And Bilingualism With Speech And Language Delays

Variable	LEST				<i>p</i>	PR	CI
	Speech and language delay		Un-speech and language delay				
	n	%	N	%			
Hearing Loss							
Yes	34	60,7	1	4,2	0,001 [£]	33,00	4,147-261,962
No	22	39,3	23	95,8			
Status Economy							
Enough	48	85,7	23	95,8	0,180 [£]	0,261	0,031 – 2,212
Less	8	14,3	1	4,2			
Bilingual							
≥ 2 languages	43	76,8	16	66,7	0,346 ^{¥*}	0,605	0,211-1,730
1 language	13	23,2	8	33,3			

Description : * Significance ($p < 0,05$); £ Fisher's exact, ¥ Pearson chi square;

Source: primary data, 2021

Characteristics (table 1) the education of the parents (father) with the highest number of bachelors is 33 (41.3%), the highest number of mothers is high school 39 (48.8%). Economic status is less 9 (11.3%) and enough 71 (88.8%). Bilingual criteria obtained 2 languages 59 (73.8%) and 1 language 21 (26.3%). The results of the study showed that there were no less hearing 46 (57.5%) and hearing loss 34 (42.5%). LEST criteria obtained un-speech delay 24 (30%) and speech delay 56 (70%).

Association of hearing loss with speech and language delay (table 2). Patients with speech and language delay 22 (39.3%) did not have hearing loss and 34 (60.7%) had hearing loss. This result is in accordance with the study which states that 100 children with suspected speech and language delays underwent ABR examination, it was found that 70% of children with hearing loss, (Shoukrya 2010). Patients with un-speech and language delay were 23 (95.8%) and 1 (4.2%) had hearing loss. Fisher's exact test showed that hearing loss was a significantly associated risk factor. Hearing loss had a 33 times greater risk (PR 33.00) than non-hearing lost.

The results obtained from 80 samples, with 54 men and 26 women, are in accordance with a 2016 study on 100 children who visited the Jawarhal Nehru Hospital India, the ENT-KL section and the Children's section with suspected speech and language delays is 58% in boys and

48% in girls, (Mondal et al. 2016). Meanwhile, in a previous study on 702 children with speech and language delays, 425 (60.5%) boys were less hearing and 277 (39.5%) girls lacked hearing, (Lange et al. 2016). The functional connectivity of the neural network of the male brain tends to have a reduced capacity for processing social stimuli, and therefore males are more prone to impaired communication, (Adani & Cepanec 2019). One of the causes of speech and language delays is hearing loss. In this study, hearing loss was found to be more common in men than women. The same condition was also found in other studies which showed that hearing loss was more common in boys than girls, (Singraiah et al. 2017). This is probably due to anatomical differences in the peripheral auditory pathways, the volume of the ear canal in males is relatively wider when compared to females, in addition, the cochlea in females is shorter than the cochlea in males. This causes the stimulus in women to arrive more quickly, (Shuster et al. 2019).

The effects of hearing loss depend on the nature and extent of the hearing loss and the individual characteristics of the child. Hearing loss can be unilateral or bilateral, conductive, sensory-neural, mixed, mild, moderate, severe, profound, sudden or gradual onset. This hearing loss can lead to speech and language delays. Hearing loss that happens very early in life can affect speech and language development,

social and emotional development, behavior, attention, and academic achievement (Ganavi et al. 2015).

The quality of speech and language reflects the ability to hear and perceive sounds. Usually there is a direct relationship between speech/language ability and the amount of hearing residue. Mild or severe hearing loss has a negative effect on speech and language development. The effects of severe deafness tend to be real. Vocabulary, word order and use of grammar become messy. Voice distortion, speech errors and rhythm deviations are typical, so speech is difficult to understand. The use of hearing aids and amplification devices is important to reduce hearing loss, so that children can hear other people's voices as well as their own voices. Hearing aids are one aspect of the habilitation process. (Osama et al. 2010). Hearing loss repair that is done early at the age of 2 to 3 years will result in better speech and language development. This may be due to the existence of a sensitive period that is important for language development by assessing the effect of age at implantation on cognitive and linguistic skills, (Houston & Miyamoto 2010)

Babies generally quickly learn from the home environment and its surroundings. Between the ages of 6 – 12 months, children's ability to process speech develops rapidly, and this ability can predict language development in later life. The basic idea is that hearing loss limits access to auditory learning so that children do not get auditory experience, so immediate intervention is needed to facilitate this access, (Tager-Flusberg 2015), (Zhao & PKuhl 2016).

The results of this study showed that there were 9 people with poor economic status (11.3%) and sufficient economic status as many as 71 people (88.8%). In 24 children with no delay in speech and language, 23 children (95.8%) were found with sufficient economic status and 1 child (4.2%) with less economic status. Of the children who experienced speech and language delays as many as 56 samples obtained 8 patients (14.3%) with less economic status while as many as 48 patients (85.7%) with sufficient economic status. Fisher's exact test showed that economic status was a risk factor that was not associated with speech or

language delay. This can be caused by speech and language delays that can be experienced by those with economic status, either with less or sufficient income. The most relevant factor for children's language development is probably the education of parents, not household income itself, (Hoff 2013), (Hurt & Betancourt 2016), (Schwab & Lew-williams 2016).

In this study, the sample obtained with 80 research samples obtained 2 languages as many as 59 people (73.8%) and 1 language as many as 21 people (26.3%). Of the 24 samples of patients who were not late in speech and language, 16 patients (66.7%) spoke 2 languages, while 8 patients (33.3%) spoke 1 language. Then from patients with delays in speech and language as many as 56 samples obtained 43 patients (76.8%) with 2 languages while 13 patients (23.2%) with 1 language. The chi-square test showed that bilingualism was a risk factor that was not associated with speech and language delays in children ($p = 0.346$; $RP 0.605$; 95% $CI 0.211-1.730$). This is different from previous studies that bilingual language affects speech and language delays in children, (Hoff & Ribot 2017). This difference may be due to the technique of collecting data using telephones which can lead to misunderstandings between respondents and researchers.

Conclusion

This study showed that the risk factors for hearing loss were significantly associated with speech and language delays in children. There is no significant relationship between economic status factors and bilingual use on speech and language delays in children. Further research is needed to include behavioral disorders as another risk factor. The limitation of this study is that behavior disorders are not included as a risk factor for speech delay because it is difficult to identify.

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Knowledge, Attitude, and Practice using the Kangaroo Method Care in Maternal with Low Birth Weight Babies

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Abstract

Newborn mortality is still quite high in the world, including Indonesia, one of which is caused by complications of premature birth. Kangaroo Method Care (KMC) is one way to keep the newborn's body temperature warm by making direct contact between the baby's skin and the mother's skin. The purpose of this study was to analyze the relationship between knowledge, attitude, and practice of Kangaroo Care Method for mothers with low birth weight (LBW) infants. This study is a quantitative study with a cross-sectional approach. Respondents in this study were mothers who had LBW after treatment from the Regional General Hospital (RSUD) Koja, North Jakarta who were domiciled in Koja, Tanjung Priok, and Cilincing Districts, North Jakarta, amounting to 50 people. Data was collected using questionnaires and observations, and analyzed using the Spearman Correlation statistical test. Based on the results of the study, the average score of mother's knowledge about Kangaroo Care Method was 21.76 (SD 1.06); the average score of the mother's attitude towards the Kangaroo Care Method is 26.74 (SD 0.80); and the average duration of practice for Kangaroo Care Method is 2.92 hours/day (SD 0.90). Based on the results of observations, it was found that most of the LBW mothers had practiced Kangaroo Method Care by holding the right position from Kangaroo Method Care. Based on the Spearman Correlation statistical test, it was found that there was a relationship between knowledge, attitude, and practice of the Kangaroo Care Method in LBW mothers.

Introduction

Infant and neonatal mortality is still a problem in the health sector, both in the world and in Indonesia. The Infant Mortality Rate (IMR) and Neonate Mortality Rate are increasing from year to year. The main problem causing infant mortality is during the neonatal period, which contributes to 59% of infant deaths in Indonesia. The age of the first 28 days of life (neonatal period) is the most vulnerable time for child survival. There are several causes of death in the neonatal period, one of which is complications of premature birth which is the single largest direct cause of neonatal death and the second most common cause of under-five mortality after pneumonia (Liu et al., 2012).

Preterm birth accounts for 50% of all neonatal deaths (Lawn et al., 2010).

The weight of the baby at birth plays an important role in the health and survival of the baby. Low Birth Weight (LBW) is a group of babies born weighing less than 2500gr regardless of gestational age, either premature or at term. The number of LBW cases in Indonesia was 10.2% in 2018. The incidence of LBW is a significant public health problem because it has an impact on health and cognitive, motor, and social/emotional function development, both in the short and long term.

Low birth weight infants have a higher risk of death due to hypothermia and must be treated in the intensive care unit and cared for

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in an incubator. In addition, LBW is at risk for infectious diseases, growth and development delays, and death in childhood (Soleimani et al., 2014; Ballot, et al., 2012). Kangaroo Method Care (KMC) is one way to keep the baby's body temperature warm and prevent heat loss in the baby's body. KMC is a treatment for LBW by making direct contact between the baby's skin and the mother's skin (skin-to-skin contact). Mothers who practice KMC can regulate or adjust their body temperature to the baby's temperature and can reduce the risk of hypothermia in LBW (Agudelo CA & Belizán JM, 2011; Boundy, et al., 2018; Ludington-Hoe, S. M., et al., 2000; Ludington-Hoe SM, 1993).

Low birth weight babies can receive KMC inside and outside the hospital. Kangaroo Care Method can be performed on LBW whose condition is stable, i.e. they can breathe spontaneously, are able to breastfeed or get breast milk through a cup or spoon, and do not have serious health problems. Low birth weight infants who return home after intensive care in the hospital have various risk factors for disease, developmental disorders, and survival. Optimal LBW care and continuous practice of KMC at home are very necessary to keep the baby's temperature stable and avoid health problems in the baby.

North Jakarta is the area with the 2nd highest prevalence of IMR and LBW in DKI Jakarta. Based on a preliminary study through a qualitative approach conducted in the Districts of Koja, Tanjung Priok, and Cilincing, North Jakarta (Mustikawati, IS, et al., 2020), It was found that the KCM practice carried out by LBW mothers at home was not as optimal as the KCM practice that was done previously in the hospital. The difference in conditions between the hospital and the home will affect the practice of KCM at home. Based on the results of interviews with LBW mothers, it was found that several inhibiting factors in

practicing KCM at home, namely the lack of understanding and belief of mothers that KCM is a solution to LBW problems. Therefore, this study aims to analyze the relationship between knowledge, attitudes, and practices of KCM among LBW mothers in North Jakarta.

Method

This study is a quantitative study with a cross-sectional approach. The population in this study were mothers who had low birth weight after treatment from the Regional General Hospital (RSUD) Koja, North Jakarta, who were domiciled in the Districts of Koja, Tanjung Priok, and Cilincing, North Jakarta. The sample size was calculated using the cross sectional sample formula (Lemeshow et al, 1997), so the number of samples in this study was 50 people. The sampling technique used was consecutive sampling, where all respondents who had certain criteria were included in the study, namely mothers who had babies weighing <2300 g at the time of the study, healthy mothers and having healthy babies.

Data was collected using a questionnaire to measure knowledge, attitudes, and practices of KCM among LBW mothers. To add to the results obtained in the collection of quantitative data, observations were also carried out aimed at observing the practice of KCM in LBW mothers. Data analysis in this study consisted of univariate analysis which was used to present data on knowledge, attitudes, and practices of KCM in LBW mothers and bivariate Spearman Correlation analysis which was used to analyze the relationship between knowledge, attitudes, and practices of KCM among LBW mothers. The research ethics letter was obtained from the Research Ethics Committee and Public Health Service, Faculty of Public Health, University of Indonesia No. 767/ UN.2/F.10/ PPM.00.02/2019.

Results and Discussion

The following are the characteristics of respondents in this study.

Table 1. Characteristics of Respondent

Variable	Mean (SD)
Mother's age (years)	30,83 (7,135)
Gestational age (weeks)	33,77 (1,832)
Baby's birth weight (gr)	1864,48 (174,38)
Baby's weight home (gr)	1936,88 (129,25)

Variable	n (%)
Mother's education	
- Low education	23 (46)
- High education	27 (54)
Mother's employment status	
- Does not work	47 (94)
- Work	3 (6)
Parity	
- Primipara	10 (20)
- Multipara	40 (80)
Type of childbirth	
- Normal	25(50)
- Action	25 (50)
Nearest health facility	
- Public health center	46 (92)
- Clinic	4 (8)
Distance to health facilities	
- <1 km	27 (54)
- 1-3 km	15 (30)
- >3 km	8 (16)

Source: Primary data, 2020

Knowledge of LBW mothers about KCM in this study was measured by asking respondents by filling out a questionnaire consisting of 12 questions. Questions about KCM included the definition of KCM, the main benefits of KCM, duration of KCM, limits of KCM, KCM equipment, KCM actors, preparation before KCM, danger signs during KCM, the best drink for LBW, how to breastfeed, and frequency of breastfeeding. Based on the results of the study, the average score of mother's knowledge about KCM is 21.76 (SD 1.06). Most of the LBW mothers were able to correctly answer questions about the definition of KCM, the main benefits of KCM, the duration of KCM, KCM clothes, KCM cloth, preparation before KCM, the best drink for LBW, how to breastfeed, and the frequency of breastfeeding. However, they do not know about the duration of KCM, the perpetrators of KCM, and the danger signs during KCM.

Knowledge is the result of knowing

and occurs after someone has sensed a certain object. Knowledge is the result of a person's learning process for something that is heard or seen. In general, LBW mothers in this study knew about KCM. This could be because LBW mothers had previously received education about KCM at Koja Hospital, North Jakarta, so they were exposed to information about KCM.

The results of this study are in agreement with other studies in India (Darmstadt et al., 2006) that the mother knows that KCM is useful for preventing hypothermia, making the baby comfortable, and increasing the mother's ability to prevent evil spirits (according to local culture). Other research in India (Mazumder, S., et al., 2018) also mentioned that the mother knew that KCM was beneficial for increasing the baby's weight and increasing the baby's activity. Likewise with research in Ethiopia (Roba, A., et al., 2017) which stated that most of the mothers knew the benefits of KCM and research in Ghana (Nguah et al., 2011) that

mothers know that KCM is beneficial for both mother and baby.

However, in this study, it was found that there were LBW mothers who still did not know about the danger signs during KCM, the duration of KCM, and the perpetrators of KCM. The results of this study are in agreement with other studies in Nigeria (Opara, PI & Okorie, 2017) that mothers do not know that other people can replace mothers to practice KCM. There are several stages of receiving information in a training or education, namely reaction, analysis, application, and results in the organization (Smidt et al., 2009). Referring to the model, the LBW mothers in this study were at the analytical level, where when they were exposed to information about KCM previously in the hospital, there was information that was accepted or not well received by LBW mothers.

Mother's attitude towards KCM in this study was measured by asking the respondents by filling out a questionnaire consisting of 8 statements. The statement of attitude towards KCM includes the benefits of KCM, duration of KCM, KCM actors, the best drink for LBW, KCM and breastfeeding. Based on the results of the study, the average score of the mother's attitude towards KCM was 26.74 (SD 0.80). Most of the LBW mothers agreed and strongly agreed that KCM can provide warmth to the baby, increase breastfeeding, increase affection between mother and baby, increase baby's weight, and mothers can breastfeed their babies when doing KCM. However, they do not agree if KCM is carried out continuously or 24 hours a day, if KCM is carried out by all family members, and if small babies do not need to be given additional formula milk to gain weight quickly.

Attitude is a reaction or response that is still closed from a person to a stimulus or object. Attitude is also a readiness or willingness to act and is also the implementation of certain motives. Attitude is a person's closed response to a stimulus or object, both internal and external so that its manifestation cannot be directly seen, but can only be interpreted beforehand from the closed behavior. Attitudes in reality indicate a suitability of responses to certain stimuli.

In general, LBW mothers in this study agreed about the benefits of KCM. This could

be because LBW mothers had previously been exposed to information about KCM at Koja Hospital, North Jakarta, so they agreed that KCM was beneficial for their babies. The results of this study are in accordance with research in Ethiopia (Roba, A., et al., 2017) that most mothers have a positive attitude towards KCM, where KCM can stabilize the baby's temperature, improve the relationship between mother and baby, improve infant development, and have a positive impact on breastfeeding. While other research in India (Darmstadt et al., 2006) that skin-to-skin contact (KCM) is thought to prevent hypothermia in newborns, increase the mother's ability to protect her baby from evil spirits, and make the baby more comfortable.

However, in this study it was found that there were LBW mothers who did not agree that KCM should be carried out continuously or 24 hours a day, KCM can be done by all family members, and that small babies do not need to be given additional formula milk to gain weight quickly. The results of this study are in agreement with other studies in India (Mazumder, S., et al., 2018) that mothers do not agree to practice KCM for a long time because mothers need to rest after giving birth. Attitudes can be divided into negative attitudes, namely attitudes that indicate rejection or disapproval of the prevailing norms where the individual is located and positive attitudes, namely attitudes that indicate acceptance of the prevailing norms where the individual is located.

The practice of KCM for LBW mothers in this study was measured by asking respondents by filling out a questionnaire regarding the duration of mothers practicing KCM in one day (hours/day) and observing the position of KCM through an observation sheet. All LBW mothers continued the practice of KCM at home after treatment from the hospital with different durations of time. The average duration of KCM practice for LBW mothers is 2.92 hours/day (SD 0.90). Based on observations, it was found that most of the LBW mothers had practiced KCM by holding the KCM in the right position, namely skin-to-skin contact between mother and baby with the mother and baby undressed. However, it was found that there were a small number of LBW mothers who did not properly

position the KCM, for example only a small part of the baby's body was attached to the mother's skin and the KCM was too tight or loose. The improper position of holding KCM can reduce the benefits of skin-to-skin contact between mother and baby.

Practice or action is the realization of the knowledge and attitude of a real action. Action is a person's response to a stimulus in a real or open form. Action is a movement or action of the body after receiving stimulation or adaptation from inside or outside the body of an environment. Knowledge and attitudes of LBW mothers regarding KCM will also affect the practice of KCM.

Several studies show that there are different durations of practicing KCM (Dawar, et al., 2019; Nguah et al., 2011; Opara, PI & Okorie, 2017; Rasaily, R., et al., , 2017). A study in India (Dawar et al., 2019) mentioned that KCM was practiced with an average duration of 3.3 hours per day and 5.1 days per week. While other research in India (Raajashri, R. & Adhisivam, B., 2018) mentioned that mothers practice KCM at home with an average FMD duration of 1.3 hours per day. A study in Ghana (Nguah et al., 2011) mentioned that most mothers prefer to practice KCM intermittently even though they have been given previous education at the hospital to give KCM continuously because the benefits are better than KCM intermittently. While other studies in Nigeria (Opara, PI & Okorie, 2017) shows that mothers practice KCM with an average of 3.25 hours/day.

The results of this study are not far from other studies that most mothers practice KCM for 2 hours in one day (Bazzano et al., 2012) and another study conducted in India found that the average mother practiced KCM for five hours per day and 55.4% of these women initiated KCM within 72 hours of birth (Rasaily, R., et al., 2017). While research conducted in Nigeria (Opara, PI & Okorie, 2017) showed that more than 95% of mothers felt comfortable in practicing KCM at home with KCM duration of 3.25 ± 2.85 hours (0.5-12 hours) per day and no baby had problems with KCM. Research conducted in Ethiopia (Roba, A., et al., 2017) mentioned that mothers practice KCM for 2 hours/day. The average score of KCM

knowledge, attitudes, and practices can be seen in the following table.

Table 2. Knowledge, Attitude, and Practice of KCM among LBW mothers

Variable	Mean (Sd)
Knowledge of KCM	21,76 (1,06)
Attitude about KCM	26,74 (0,80)
KCM Practice	2,92 (0,90)

Source: Primary data,2020

Based on the statistical test of Spearman Correlation, there is a relationship between knowledge of LBW mothers about KMC and KMC practice (p value <0.05 ; $r=0.53$). Thus, the knowledge of LBW mothers about KMC has a strong relationship with the practice of KMC. In this study, in general, LBW mothers know and have received education about KMC before at Koja Hospital, so that this knowledge can influence mothers to practice KMC at home.

Knowledge is the result of a person's learning process for something that is heard or seen. Knowledge is the most important factor (predisposition) that can influence behavior. The better a person's knowledge, the better his behavior. Knowledge relates to the amount of information a person has, where the more information a person has, the higher a person's knowledge. The more information LBW mothers have about KMC, the better their knowledge and understanding of KMC will be.

The existence of supporting factors in practicing KMC is an important factor that makes mothers willing and able to do KMC. These supporting factors can come from mothers, families, communities, and health services (Mustikawati, IS, et al., 2020). Factors that come from the mother herself, for example, the mother's knowledge and awareness about the benefits of KMC. In this study, the mother's knowledge of KMC can influence the practice of KMC.

The results of this study are in accordance with other studies, that mother's knowledge of KMC can improve KMC practice (Alenchery et al., 2018; Darmstadt et al., 2006; Nguah et al., 2011; Mazumder, S., et al., 2018). Knowledge of the benefits of KMC and how to do KMC will improve the implementation of KMC. The existence of knowledge about KMC can

increase awareness of KMC and can improve the practice of KMC at home with the support of family members (Alenchery et al., 2018).

Based on the Spearman Correlation statistical test, there was a relationship between the attitudes of LBW mothers regarding KMC and the practice of KMC (p value <0.05; r=0.55). Thus, the attitude of LBW mothers regarding KMC has a strong relationship with the practice of KMC. In this study, in general, LBW mothers had a positive attitude towards the benefits of KMC. According to them, the reason for wanting to practice KMC at home is so that the baby's weight increases, is healthy, and strong. The existence of a positive attitude can influence mothers to practice KMC at home.

Attitude is a person's response to a stimulus obtained from his five senses. Someone who is positive about the benefits of KMC, it will improve the practice of KMC. Lack of assistance in KMC practice, and lack of mother's awareness of KMC and baby's health are inhibiting factors for KMC implementation (Seidman et al., 2015). Mothers who have good knowledge, attitudes, and practices regarding KMC can influence the results of KMC so that the baby's weight can be optimal (Nguah et al., 2011)

Behavior is a response to a stimulus that is influenced by many factors, including personal characteristics. Factors that influence behavior are divided into internal factors and external factors. Internal factors are factors that come from within a person, such as age, gender, etc., and external factors come from outside the person, such as physical, social, cultural, economic, political and other environments. Behavior is determined by three groups of factors, namely predisposing factors which include individual knowledge, attitudes, beliefs, traditions, social norms and other elements contained in individuals and society; enabling factors, namely the availability of health services and facilities; and reinforcing factors which constitute the attitude and behavior of workers.

The results of this study are consistent with other studies, that a positive attitude about the benefits of KMC can improve the practice of KMC. A study in India showed that awareness of the benefits of KMC will manifest

in practice, where LBW mothers agree that KMC is beneficial for increasing baby weight and activity (Mazumder, S., et al., 2018) and mothers who realize the benefits of KMC, will practice KMC at home (Alenchery et al., 2018). In Ghana, almost all LBW mothers think that Kangaroo Method Care (KMC) is beneficial for both mother and baby and they are willing to practice it and will recommend KMC to other mothers (Nguah et al., 2011). The relationship between knowledge, attitude, and practice of Kangaroo Method Care (KMC) in LBW mothers can be seen in Table 3.

Table 3. KCM Knowledge, Attitude and Practice Relationship to LBW mothers

	Practice	
	r	Value p
Knowledge	0,530	<0,001
Attitude	0,549	<0,001

Source: Primary data, 2020

Conclusion

Based on the results of the study, the average score of mother's knowledge about Kangaroo Method Care (KMC) was 21.76 (SD 1.06), where most of the LBW mothers knew about the definition of KMC, the main benefits of KMC, KMC period, KMC clothes, KMC cloth, preparation before KMC, best drink for LBW, method of breastfeeding, and frequency of breastfeeding. However, they do not know about the duration of KMC, the perpetrators of KMC, and the danger signs during KMC. The average score of the mother's attitude towards KMC is 26.74 (SD 0.80), where most of the LBW mothers agree and strongly agree that KMC can provide warmth to the baby, increase breastfeeding, increase affection between mother and baby, increase the baby's weight, and the mother can breastfeed the baby when doing KMC. However, they do not agree if Kangaroo Method Care (KMC) is carried out continuously or 24 hours a day, if KMC is carried out by all family members, and if small babies do not need to be given additional formula milk to gain weight quickly. The average duration of KMC practice was 2.92 hours/day (SD 0.90). Based on observations, it was found that most of the LBW mothers had practiced KMC by holding the KMC in the right position. Based

on the Spearman Correlation statistical test, it was found that there was a relationship between knowledge, attitude, and practice of KMC in LBW mothers. It is necessary to provide continuous communication, information, and education to LBW mothers to improve knowledge, attitudes, and practices of KMC.

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Quality of Diet and Nutritional Status on Male Young Athletes in Central Java

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Abstract

Fulfilling energy and nutritional intake that is not in accordance with dietary recommendations and nutritional guidelines will affect the quality of athlete's diet. Preliminary study results that an average of athlete's energy consumption only 74% of the recommended energy requirement and 8% athletes are undernutrition. This study aims to evaluate the quality of the diet and sufficiency of energy and nutrition and to determine the relationship with the nutritional status of young male athletes. This study was conducted in 2019. Kind of this study is observational analytic, which using a cross sectional design to 85 young male athletes of the Central Java Student Sports Education and Training Center from 9 kind of sports (takraw, weightlifting, swimming, fencing, basketball, rowing, volleyball, soccer, and athletics). The subjects were measured of their weight, height, fat mass, and waist circumference and then determined their nutritional status (BMI age, body fat percentage, and height ratio). Energy and nutritional sufficiency were obtained by interview using the Semi-Quantitative FFQ, and data of food quality were obtained by using the Diet Quality Index International (DQI-I) questionnaire. Data analysis used the Spearman Rank Test with a significance level (α) 0.05 and a confidence level of 95% CI. The results showed that the quality of the foods ($p = 0.144; 0362; \text{ and } 0296$), as well as the sufficient energy and nutrients ($p = 0.143; 0410; 0608; 0153; 0735; 0836; 0222; 0533; 0326; 0553; 0392; \text{ and } 0308$) but they were not related to nutritional status (BMI age, body fat percentage, and WtHR). It was concluded that the quality of the diet was related to energy and nutritional sufficiency, but both of them do not show a significant relationship with the nutritional status of young male athletes of Province of Central Java.

Introduction

Fulfilling nutritional needs is a major requirement which becomes basic of every athlete to support their performance. It is not only in exercise programs and physical activity, good nutritional management for athletes, especially athletes who are still younger (athletes from children to adolescent), is certainly an integral part of athlete performance management. Adolescent athletes certainly need special attention, because this period is called as growth spurt, as effect of increasing their physical activities due to intensive training programs, which resulting of increase of energy and nutritional needs (Lloyd et al. 2015). Failure of fulfilling the energy and nutritional needs of adolescent athletes will certainly affect to

growth disorders. If this happens continuously for a long time, it will interfere with the fulfillment of energy needs during training and competitions. This will effect of decreasing athlete's performance (Penggali et al. 2017) and (Oladunni and Sanusi 2013).

Although the managers knows that nutrition management in adolescent athletes is very important, but in fact, good food management for athletes, especially adolescent, still does not get the same priority as an exercise program. In addition, the problem of good food superintendence in athletes are also becomes an obstacle in nutritional management. The wrong choice of food ingredients, poor dietary habit and insufficient daily intake that occurs continuously will decrease the quality

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of athlete's performance. Previous research in 2015 on adolescent soccer athletes in London showed that the average daily energy intake was still insufficient when compared to energy expended, even though the average fat intake was excessive. Other research data on ultra-endurance cycling athletes showed over that the average athlete's nutritional intake is still lower than that of energy expended. Other research on athletes in various sports shows that the athlete's energy and carbohydrate intake still does not fulfill the recommendations, while protein and fat intake shows the level of fulfillment of excessive intake when compared to recommendations ((Briggs et al. 2015); (Bescós et al. 2012); (Mielgo-Ayuso et al. 2015))

Poor management of athlete's nutrition management does not only effect on decreasing the quality of athlete's performance, it also has negative impact on the nutritional status and growth of adolescent athletes. Research on early age soccer athletes (9-12 years) at the Sinar Harapan Football School, Tulangan, Sidoarjo, East Java showed that there were relationship between the level of adequacy of energy and fat to the nutritional status of athletes (Nur Amin 2017) . Another study was conducted on 40 martial arts athletes aged 14-18 years who showed that adequacy levels of energy and nutrients (carbohydrates, protein, and fat) were not significantly related to nutritional status of BMI for age (Mardiana et al. 2019).

It was stated previously that a adolescent athlete who is still in a period of growth and development certainly needs optimal nutritional intake to support his growth. Fulfilling energy and nutritional intake that is not in accordance with dietary recommendations or nutritional guidelines will affect the quality of athlete's diet. Diet quality assesses the quality and variety of food ingredients which are consumed and can be related to a person's health status. In addition, diet quality is able to describe the quality of energy consumption, sugar, saturated fat, vegetables, fruits, meats and vegetables and micronutrients (Vilela et al. 2014); (Sahara, Widayastuti, and Candra 2019)). This research aimed to evaluate the quality of the diet and the level of energy and nutrient sufficiency in adolescent male athletes at the Jatidiri Sport Arena complex, Semarang, Central Java. In

addition, this research also examined the relationship between diet quality and adequacy levels of energy and nutrients with nutritional status using indicators of Body Mass Index (BMI) for age, body fat percentage, and Waist-Height Ratio (WtHR).

Method

This analytic observational research was conducted using a cross sectional research design and was completed at the end of September 2019. This research was conducted at the Jatidiri Sport Arena complex, Semarang, Central Java. The research subjects were selected using a random sampling technique, as many as 85 people from a total population of 108 adolescent male athletes. As for the research subjects were athletes from 9 kind of sports (football, weightlifting, swimming, fencing, basketball, rowing, volleyball, football, and athletics) and fulfill the criteria, including aged 13-18 years, male, being a PPLP athlete of Central Java Province, being not sick or has a history of cardiovascular disease, metabolic syndrome, immunity disorders, and or orthopedic disorders, and is not currently using or has ever used drugs or supplements that can affect muscle work, and is willing to take part in a series of studies through informed consent.

Physical measurements taken on research subjects included measurements of body weight, height, waist circumference, and thickness of subcutaneous fat. Measurement of body weight using the OMRON Digital Personal Weight Scale Type HN-289 (0.1 kg precision level) and height measured using the GEA Wireless Body Height Meter Type HT-721 (0.1 cm precision level). Waist circumference was measured using a metline (0.1 cm precision level). The thickness of the subcutaneous fat was measured using the KaradaScan Body Composition Monitor Type HBF-375.

The level of energy and nutrient adequacy was obtained from the results of interviews with research subjects about the average daily food intake using the Semi-Quantitative FFQ (Food Frequency Questionnaire). The results of the interview regarding the average daily intake then would be converted into units of calories (energy) and grams (macro nutrients) and compared with the energy and nutrient

requirements for athletes who are specifically based on TEE (Total Energy Expenditure) calculations. The adequacy level of energy and nutrients can be calculated using the formula:

$$\text{Energy and Nutrients Adequacy\%} = \frac{\text{daily intake}}{\text{Total Expenditure}} \times 100\%$$

The percentages of adequacy levels of energy and nutrients were categorized into three groups, namely deficit (<80% TEE), adequate (80-110% TEE), and excessive (> 110% TEE) (WNPG, 2014). Characteristic data of research subjects including age, sports, physical measurement data, nutritional status, adequacy levels of energy and nutrients, and diet quality were analyzed descriptively and displayed in table form. Bivariate analysis used the Spearman Rank Test to assess the relationship between diet quality, adequacy levels of energy and nutrients with nutritional status (BMI for age, body fat percentage, and WtHR) with a significance level (α) 0.05 and a confidence level of 95% CI.

Result and Discussion

The results showed that most of the research subjects still showed poor diet quality. The level of energy and nutritional adequacy of research subjects is mostly still unable to meet daily needs even though there are also research subjects who show excessive levels of energy and nutrient fulfillment. Besides that,

this research have measured anthropometrics assessment. Anthropometrics assessment defined as physical measure of body size and body composition include measurement of height, weight, body circumference like waist, hip, mid-thigh, calf, biceps and subcutaneous fat thickness (Ackland et al. 2012); (Larson-Meyer, Woolf, and Burke 2018). The results of the assessment of nutritional status in research subjects using the BMI for age index showed that most of the research subjects had normal nutritional status. However, when it was seen from the percentage of body fat based on each sport, almost part of the research subjects still had an excess percentage of body fat. Similar to the assessment of nutritional status based on the WtHR index, half of the research subjects had a waist circumference ratio to height greater than 0.42, which means they are at risk of being overweight (Table 2). The detailed characteristics of research subjects are presented in Tables 1 and 2.

BMI cannot be used as a single indicator in assessing the nutritional status of athletes ((Infante et al. 2013) and (Popa, Botnariu, and Antohe 2017). Weight which is one of the indicators used in calculating BMI is an indicator of body composition which includes the proportion of fat mass and fat-free mass including muscle, water and bone mass which of course cannot it is known specifically only through measurement of body weight (Pontaga and Židens 2011).

Table 1. The Characteristic of Research Subject

Characteristics of Subject (N=85)	Mean \pm SD	Minimum	Maximum
Age (years)	15.88 \pm 0.931	13	18
Body Weight (kg)	64.49 \pm 9.399	49.05	93.85
Height (cm)	171.30 \pm 7.012	155.40	186.60
Daily Intake of Energy and Nutrients			
Energy (kcal)	2358.20 \pm 1013.792	1120.80	7922.30
Carbohydrate (g)	360.96 \pm 162.477	134.80	1121.50
Protein (g)	96.600 \pm 46.186	38.60	304.20
Fat (g)	69.348 \pm 36.292	27.90	266.10
Energy and Nutrients Requirements			
Energy (kcal)	4678.90 \pm 1025.883	2765.04	8272.36
Carbohydrate (g)	643.35 \pm 141.059	380.19	1137.45
Protein (g)	233.94 \pm 51.294	138.25	413.62
Fat (g)	129.97 \pm 28.497	76.81	229.79

Source: Primer Data, 2019

Study which was conducted by Canda (2017) on 173 male and female athletes showed that 72% of athletes had a BMI score of overweight to obesity, but their fat mass was in the normal category. This study suggests to cross-check the results of anthropometric assessments using the IMT indicator with other indicators, such as body fat mass percent or waist circumference ratio based on height (Canda 2017). Referring to the results of this study, in this study the indicators for assessing nutritional status were used not only BMI but also indicators of body fat percentage and the ratio of waist circumference to height. High body mass, whether due to increased body fat or decreased lean body mass, has an impact on aerobic performance (Maciejczyk et al. 2014). Body composition is an important aspect of physical fitness, as well as in developing athlete profiles and conditioning programs. The relative amounts of fat and fat free mass in the body are referred to as body composition. The another research showed that the percentage body fat predict aerobic performance rather than the muscle mass (Anwar and Noohu 2016).

Based on the results of the analysis using the Spearman Rank Test correlation, it shows that the quality of the diet was not significantly related to the nutritional status of the research subjects (BMI for age, body fat percentage, and WtHR) which was indicated by a value of $p > 0.05$ ($p = 0.144; 0.362; \text{ and } 0.296$). However, the quality of the diet has a significant relationship with the level of energy and nutrient adequacy as indicated by the value of $p < 0.05$ ($p = 0.0001, r = 0.735; 0.565; 0.626; \text{ and } 0.688$) (Table 2). This is because the nutrient adequacy level is an indicator of the quantity of the diet which is one of the components in assessing the quality of the diet using DQI-I. In addition, diet quality is able to describe the quality of energy

consumption, sugar, saturated fat, vegetables, fruits, animal and vegetable side dishes as well as micronutrients such as calcium, iron, and vitamin C (Sahara, Widyastuti, and Candra 2019). Another research said there is a significant positive correlation between % body fat (BF) and energy intake of the athletes, ($r = 0.300, p < 0.05$). The athletes with $\%BF \geq 17$ receive significantly higher amounts of protein and fat in comparison with athletes with $\%BF < 17$ (Papadopoulou and Papadopoulou 2010); (Azam et al. 2018) reported that there was difference between Weight, BMI, waist-circumference, hip-circumference, and type of tour ($p < 0.05$). Finally, the most influential factors were BMI and tour type. BMI does not provide specific information about body fatness, but rather body heaviness, it is not a good predictor of BF. Methods such as bioimpedance and anthropometry could be used to monitor non-obese subjects in clinical trials and population-based studies (Gacesa et al. 2003)

Dietary quality is a method that can be used to evaluate dietary patterns and food selection behavior based on food groups. Diet quality also examines the quality and variety of food ingredients consumed and can be related to a person's health status (Vilela et al. 2014). Dietary quality measured by DQI-I may reduce weight gain in childhood and prevent chronic disease later in life (Setayeshgar et al. 2017). Based on the results of the research, most of the research subjects still showed a low quality diet with a score < 60 . When it was seen from the variation of food ingredients, all research subjects consumed various sources of protein (meat, poultry, milk and their processed products, fish, nuts, and eggs) as well as other food sources such as grains, fruits, and vegetables.

Table 2. Characteristic of Research Subject based on Quality of Diet

Characteristics of Subject	Quality of Diet (49.81 ± 7.863) (N=85)				P-Value
	Poorly		Healthy		
	N	%	N	%	
Sport Branch [^]					0.643
Takraw	9	10.6	0	0	
Weight lifting	2	2.4	2	2.4	
Swimming	6	7.1	1	1.2	
Fencing	5	5.9	1	1.2	
Basketball	10	11.8	4	4.7	
Rowing	4	4.7	1	1.2	
Volleyball	7	8.2	4	4.7	
Football	19	22.4	3	3.5	
Athletics	7	8.2	0	0	
Body Mass Index (BMI) ($21.91 \pm 2.356 \text{ kg/m}^2$) [^]					0.144
Lean	4	4.7	0	0	
Normal	59	69.4	13	15.3	
Overweight	6	7.1	3	3.5	
Body Fat Mass ($14.27 \pm 3.486\%$) [#]					0.362
Normal	39	45.9	7	8.2	
Overweight	30	35.3	9	10.6	
Waist to Height Ratio (WtHR) (0.43 ± 0.027) [#]					0.296
Normal	36	42.4	6	7.1	
Overweight	33	38.8	10	11.8	
Adequacy of Energy Intake ($64.04 \pm 32.641\%$) [^]					0.0001*
Deficit	66	77.6	3	3.5	
Adequacy	2	2.4	9	10.6	
Excessive	1	1.2	4	4.7	
Adequacy of Carbohydrate Intake ($71.42 \pm 37.640\%$) [^]					0.0001*
Deficit	58	68.2	2	2.4	
Adequacy	9	10.6	7	8.2	
Excessive	2	2.4	7	8.2	
Adequacy of Protein Intake ($51.82 \pm 26.195\%$) [^]					0.0001*
Deficit	68	80	8	9.4	
Adequacy	1	1.2	3	3.5	
Excessive	0	0	5	5.9	
Adequacy of Fat Intake ($67.86 \pm 40.923\%$) [^]					0.0001*
Deficit	60	70.6	3	3.5	
Adequacy	6	7.1	4	4.7	
Excessive	3	3.5	9	10.6	

[^]Correlation test using Spearman Rank Test

[#]Correlation test using Chi-Square Test

Significant at 0.05 and showed by notation *

Source: Primer Data, 2019

Table 3. Overview of Quality of Diet Score based on DQI-I Indicator on Research Subject

DQI-I Indicators	Mean \pm SD
Variety (0-20)	
Food Groups (meat/poultry/fish/egg, dairy/beans, grains, fruits, and vegetables) (0-15)	20.00 \pm 0.000
Protein Sources (meat, poultry, fish, dairy, beans, eggs) (0-5)	
Adequacy of Nutrients (0-40)	
Vegetables(0-5)	
Fruit (0-5)	
Grain (0-5)	
Fiber (0-5)	13.44 \pm 5.763
Protein (0-5)	
Iron (0-5)	
Calcium (0-5)	
Vitamin C (0-5)	
Moderation (0-30)	
Total Fat (0-6)	
Saturated Fat (0-6)	9.22 \pm 2.157
Cholesterol (0-6)	
Sodium (0-6)	
Empty calorie foods (0-6)	
Balance (0-10)	
Macronutrient Ratio (0-6)	7.15 \pm 1.296
Fatty Acid Ratio (0-4)	
Total Score of DQI-I (0-100)	49.81 \pm 7.863

Source: Primer Data, 2019

As for the scores for foodstuff variations, all research subjects obtained the highest score (20). However, if it was related to the level of nutrient adequacy, only a little of research subjects showed a good level of nutrient fulfillment. Similar to the level of nutrient adequacy indicators, the moderation indicators have not shown satisfactory scores for all research subjects. The balance indicator, which consists of two sub-indicators, namely the macronutrient ratio and the fatty acid ratio, was still fail to show a maximum score, especially on the fatty acid ratio sub-indicator. This was because almost all research subjects really like eating fried foods and sources of saturated fat compared to unsaturated fat (Table 3).

Adequacy levels of energy and nutrients (carbohydrates, fats, and proteins) also did not show a significant relationship to the nutritional status of the research subjects (BMI for age, body fat percentage, or WtHR) which was indicated by a p value > 0.05 (p = respectively. 0.143; 0.410; 0.608; 0.153; 0.735;

0.836; 0.222; 0.533; 0.326; 0.553; 0.392; and 0.308) (Table 4). The results of this research are in line with previous research conducted on 40 martial arts athletes aged 14-18 years which showed that adequacy levels of energy and nutrients (carbohydrates, protein, and fat) were not significantly related to nutritional status of BMI for age (Mardiana et al. 2019). However, it was different from the results of that which also examined the relationship between the level of energy and nutrient adequacy with the nutritional status of soccer athletes aged 9-12 years, which showed that the level of energy and fat adequacy was significantly related to the nutritional status of BMI for age (Nur Amin 2017). It was also different between another results that intake of energy, protein, fat and carbohydrates significantly influence changes in anthropometric indicators of body height and height/age (p = 0.00). Energy intake, fats and carbohydrates have a significant effect on body weight, BMR, BMI and muscle arm (p<0.05)

Table 4. Relation of Average of Daily Intake and Level of Adequacy of Energy and Nutrients Status of Research Subject

Variables	Nutritional Status (P-Value)		
	BMI for Age	% Fat Mass	WtHR
Food Intake			
Energy	0.344	0.958	0.688
Carbohydrate	0.508	0.534	0.622
Protein	0.950	0.858	0.400
Fat	0.576	0.750	0.613
Adequacy of Intake			
Energy	0.143	0.410	0.608
Carbohydrate	0.153	0.735	0.836
Protein	0.222	0.533	0.326
Fat	0.553	0.392	0.308

Correlation test using Spearman Rank Test
Significant at 0.05 and showed by notation *
Source: Primer Data, 2019

Adolescent athletes certainly need special attention because during this period there were major changes both physically and psychologically. The adolescent phase is a phase where growth spurt occurs during increasing of physical activity, so that it affects of increasing of need of energy and nutrients. In early adolescence to middle, there occurs rapid physical growth and it is a top of height increase (Peak Height Velocity) which will gradually decrease with age and the end of adolescence. In addition, the adolescent phase is the most productive asset in the motor development of athletes. Therefore, it is very important to pay attention to the quality and quantity of intake so that it can optimize athlete's performance in adolescence. Adolescent athletes are also more prone to injury and eating disorders, and are more at risk of dehydration, so they require dietary arrangements both in terms of quality and quantity ((Lloyd et al. 2015); (Lestari, Yanesti Nuravianda 2019)).

In order to support their performance, athletes need energy intake according to their daily needs. Energy from foodstuffs which maintain body mass, that are formed as fat mass and fat free mass, optimizing the immune system and body reproductive function. Achieving the fulfillment of daily energy needs is influenced by the balance between the energy consumed from food materials and energy expended in the form of physical activity and exercise. The quality and quantity of food consumed

and the physical condition of athletes are also important factors that determine the fulfillment of daily energy needs (Nur Amin 2017). There are numerous scientific studies that show that high-CHO diets or CHO solutions consumed before exercise allow for an increase in muscle glycogen concentration, delaying the onset of fatigue and improving performance. enhancing performance (Burke et al. 2011). Some of them have concentrated solely on soccer, working to improve their skills, total distance travelled, ability to perform high-intensity activities ((Souglis et al. 2013); (Kingsley et al. 2014)), and technical performance (Russell and Kingsley 2014), as well as a decrease in net muscle glycogen utilization across throughout the game.

Conclusion

Based on the results of this research, it can be concluded that diet quality, daily intake and adequacy levels of energy and nutrients are not related to nutritional status (BMI for age, body fat percentage, and WtHR) of adolescent male athletes of Central Java Province. The recommendation for further research is that there is a need for research on the effect of energy density from the diet consumed and nutritional status on the energy adequacy level and performance of athletes. In addition, there is a need for research to further examine about the appropriate indicators for the assessment of nutritional status on athletes.

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Obesity in Indonesian and Taiwanese Adolescents Related to Self Perception, Diet, Exercise, and Body Image

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Abstract

Obesity prevalence in Asia was raising. Self-perception became an increasingly determinant predictor of a healthier lifestyle. The purpose of this study was to investigate the relationship between self-perception and actual BMI among Indonesian and Taiwanese teenagers. This research was cross sectional and using participatory sampling of 415 participants from 6 high schools in Indonesia, and 717 participants from 7 high schools in Taiwan. The data was taken by enumerator using the Obesity Impact on the Quality of Life Perception Questionnaire (ObI-Q) and the Projective Test. Self-perception was statistically associated with actual BMI which state that obesity might be treated by hospital, clinics, or specialist ($p < 0.001$). Self-perception was also related to degenerative disease ($p = 0.003$) and social life ($p = 0.04$). Self-perception about sports stated that obese people could be as good as normal people ($p = 0.11$). Most teenagers had the correct perception regarding ideal body image ($p = 0.04$). The multivariable analysis showed that teenagers who did not have self-perception of desire to lose weight were 6.37 times more likely to have overweight than teenagers who had self-perception of desire to lose weight. Self-perception of desire to lose weight was a variable with major contribution to actual BMI among teenagers.

Introduction

Obesity is a nutrition-related disease with the highest prevalence globally. This condition impacts medical, psychological, social and economic problems faced by countries in the upcoming years (Cena et al., 2017; Khan et al., 2020). Obesity could began from the childhood period due to more consumption of high energy, sweet and fat contained meals compared to fiber and nutrition-rich food like fruits and vegetables (Xu & Xue, 2016). The typical problem occurs on obese teenagers were stress because of unsatisfied feeling about their body shape. This perception leads to the lost motivation thus making the weight reduction

program difficult (Kimber et al., 2015).

Adult obesity was not only related to genetic factors, but also related to their environment on the developmental stages. There was strong influence of child genetic on the adult Body Mass Index (BMI), especially by variations in the LEPR/LEPROT locus. These findings suggest that different genetic factors influence the BMI of infants and children. In light of the obesity epidemic, the findings are important to inform the time and target of the prevention strategy (Alves et al., 2019). Additional pediatric obesity locus was found by a trans-ancestor meta-analysis of the 13,005 cases and 15,599 control from Europe, Africa,

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America, and East Asian ancestors (Bradfield et al., 2019).

Obesity prevalence on the people ages above 18 years old in Indonesia was steadily increasing. Data from Indonesian Basic Health Research (RISKESDAS) 2007, 2013 and 2018 the prevalences obesity ($IMT \geq 27$) consecutively were 10.5%; 14.8%; 21.8% (Balitbangkes, 2018). These numbers came along with the increase of central obesity prevalence on community aging ≥ 15 years old in those years were 18,8%; 26,6%; 31,0% (Balitbangkes, 2018). The proportion of poor physical activity (exercise less than 150 minutes per week) on Indonesian population aging > 10 years was increased from 26,1% in 2013 to 33,5% in 2018 (Balitbangkes, 2018). Obesity prevalence in Indonesia was higher in the urban areas (38,3%) compared to rural areas (28,2%) (Balitbangkes, 2018). This condition certainly is worrying due to obesity is the risk factors for diabetes, stroke, cancer, and some other degenerative disease.

Taiwan was close to Indonesia in terms of economy, social, and culture. There were many Indonesian lived in Taiwan, mostly as students and migrant workers. This condition created shared culture between two countries. Malnutrition was one of the shared problems in both countries. In Taiwan, the prevalence of overweight relatively stabilized, but the prevalence of morbid obesity and obesity increased sharply from 0,4% and 11,8% in 1993-1996 to 1,4% and 22% in 2013-2014 (Chang et al., 2017). The increasing prevalence mainly caused by low physical activity, decreased leisure sit time, and decreased sleep time. The problem is made worse by the low health literacy among school children and the high consumption of sugar-sweetened beverages (Lin et al., 2016). Fortunately, obese children in Taiwan are harboring some unique characteristics, they tend to have less disruptive behavior, have a lower prevalence of anxiety, and more unlikely to fall into depression (Puhl et al., 2013). The difference in self-perception of their own body were related to their respective cultures (Chiu et al., 2017; Handayani et al., 2020).

The community awareness regarding the risk of obesity was still low. People saw obesity as a negative trait, often showed by continuously shaming obese persons of their

own body. Increasing stigma to the obese person causing them to avoid any conversation of fat and physical activity (Webb et al., 2016). This condition particularly occurs in high school teenagers or those who just enter the college. This problem requires specific approaches, particularly related to the perception of health promotion target thus the community can accept and implement communicated messages (Redline et al., 1999). This research provided analysis of self-perception and actual body weight among Indonesian and Taiwanese teenagers.

Method

This study focused on understanding self-perceptions and actual weight teenagers in both Indonesia and Taiwan. This research was conducted using a quantitative approach with a cross-sectional design. The study was conducted after the proposal received ethical proof of ethics commissions in each country. The respondents were from 6 high schools in Indonesia and 7 high schools in Taiwan. The sampling technique used in this research was purposive sampling at the schools which meet three criterias. These criterias were: located in urban areas, public school with excellent accreditation, and agree to participate in the research. Students sit in the 11th grade were then asked for their consent to volunteered as respondents for the research. This consideration was taken to prevent our research from obstructing teaching and learning process. The reason behind the three criterias was for having similar school quality between Indonesia and Taiwan. Totally, there were 415 participants in Indonesia and 717 participants in Taiwan completed all survey package.

We adapt the questionnaire of the Obesity Impact on the Quality of Life Perception Questionnaire (ObI-Q), and the Projective Test (Hochdorn et al., 2014; Rendón-Macías et al., 2014; Zaman, 2015). The ObI-Q and the Projective Test were adapted as it is. In both countries, researcher employ translator and enumerator to help students in understanding the questions. Data analysis used a quantitative approach using the chi-square test for bivariate analysis and the logistic regression for multivariate analysis.

Results and Discussion

Data regarding self-perception and BMI were available from 1,138 teenagers. Among them, a total of 415 teenagers were from Indonesia, whereas 723 teenagers were from Taiwan. Descriptive characteristics of the teenagers are reported in Table 1. The mean age was 15.79 (± 1.48) years old, and there was a significant difference in means between Indonesian and Taiwanese teenagers ($p < 0.001$). Fifty four percent of the teenagers were males, and 149 of them were from Indonesia (24.39%). When compared to male teenagers between 2 countries, there was a statistical difference between groups ($p < 0.001$).

BMI was analyzed as a numeric variable from body weight (kg) and height (m). The

mean of BMI was 21.07 (+ 4.11) kg/m² and there was no significant difference of BMI between Indonesian and Taiwanese teenagers ($p = 0.77$). If categorized, underweight teenagers were found in 17% participants. Among them, 57,2% of them were from Indonesia and 42,7% were from Taiwan. Normal BMI were found in 59.1% teenagers. Among them, 35.6% of them were from Indonesia and 64.4% were from Taiwan. However, there were more overweight teenagers from Taiwan (86.4%) than from Indonesia (13.6%). Likewise, in obese teenagers, there were more obese teenagers from Taiwan (61.2%) than from Indonesia (38.2%). When compared to 4 categories of BMI between 2 countries, there was a statistical difference between groups ($p < 0.001$).

Table 1. Description statistics of participants

Characteristics	All	Indonesia	Taiwan	P value
Age (year), mean (SD)	15.79 (1.48)	16.12 (0.79)	15.59 (1.73)	<0.001*
Sex				
Male, n (%)	611 (53.7%)	149 (36.1%)	462 (63.7%)	<0.001*
Female, n (%)	527 (46.3%)	264 (63.9%)	263 (36.3%)	
BMI (kg/m ²), mean (SD)	21.07 (4.11)	21.12 (3.97)	21.04 (4.19)	0.77
BMI category				
Underweight, n (%)	194 (17%)	111 (26.9%)	83 (11.4%)	<0.001*
Normal, n (%)	672 (59.1%)	239 (57.9%)	433 (59.7%)	
Overweight, n (%)	169 (14.9%)	23 (5.6%)	146 (20.1%)	
Obesity, n (%)	103 (9.1%)	40 (9.7%)	63 (8.7%)	

* P value < 0.05 is considered significant.

Source: Primer Data, 2020

Table 2. Self-Perception and Actual Weight (BMI Category) in Indonesian dan Taiwanese Teenagers

Self-Perception	Overweight	Non-overweight	All	P value
Desire to lose weight				
No, n (%)	27 (5.1)	503 (94.9)	530 (100)	<0.001*
Yes, n (%)	174 (28.6)	434 (71.4)	608 (100)	
Reason to lose weight				
For appearance				
No, n (%)	83 (13.3)	540 (86.7)	623 (100)	<0.001*
Yes, n (%)	118 (22.9)	397 (77.1)	515 (100)	
For better health, n (%)				
No, n (%)	63 (10.2)	553 (89.8)	616 (100)	<0.001*
Yes, n (%)	138 (26.4)	384 (73.6)	522 (100)	
For better well-being, n (%)				
No, n (%)	150 (16.4)	765 (83.6)	915 (100)	0.02

Yes, n (%)	51 (22.9)	172 (77.1)	223 (100)	
To get in shape, n (%)				
No, n (%)	119 (17.1)	575 (82.9)	694 (100)	0.57
Yes, n (%)	82 (18.5)	362 (81.5)	444 (100)	
To fit the clothes, n (%)				
No, n (%)	154 (15.5)	841 (84.5)	995 (100)	<0.001*
Yes, n (%)	47 (32.9)	96 (67.1)	143 (100)	
The role of genetics in obesity				
Not important at all, n (%)	35 (23.8)	112 (76.2)	147 (100)	0.20
Somewhat important, n (%)	39 (15.8)	208 (84.2)	247 (100)	
Important, n (%)	70 (17)	342 (83)	412 (100)	
Very important, n (%)	57 (17.2)	275 (82.8)	332 (100)	
Diet and exercise might induce weight loss				
No, n (%)	47 (22.2)	165 (77.8)	212 (100)	0.05
Yes, n (%)	154 (16.6)	772 (83.4)	926 (100)	
Obesity might be treated by				
Hospital, clinics, or specialists, n (%)				
No, n (%)	142 (21)	535 (79)	677 (100)	<0.001*
Yes, n (%)	59 (12.8)	402 (87.2)	461 (100)	
General practitioners, n (%)				
No, n (%)	151 (18.7)	655 (81.3)	806 (100)	0.14
Yes, n (%)	50 (15.1)	282 (84.9)	332 (100)	
Dietitians/ nutritionists, n (%)				
No, n (%)	97 (18.8)	418 (81.2)	515 (100)	0.35
Yes, n (%)	104 (16.7)	519 (83.3)	623 (100)	
Social workers, n (%)				
No, n (%)	191 (17.9)	877 (82.1)	1068 (100)	0.44
Yes, n (%)	10 (14.3)	60 (85.7)	70 (100)	
Individual efforts to eat a healthy diet and do physical activity, n (%)				
No, n (%)	30 (19.5)	124 (80.5)	154 (100)	0.53
Yes, n (%)	171 (17.4)	813 (82.6)	984 (100)	
Bariatric surgery, n (%)				
No, n (%)	183 (17.9)	838 (82.1)	1021 (100)	0.50
Yes, n (%)	18 (15.4)	99 (84.6)	117 (100)	
Prescribed drugs, n (%)				
No, n (%)	191 (17.9)	878 (82.1)	1066 (100)	0.39
Yes, n (%)	10 (13.9)	62 (86.1)	72 (100)	
Obesity is related to degenerative disease				
No, n (%)	68 (23.4)	233 (76.6)	291 (100)	0.003*
Yes, n (%)	133 (15.7)	714 (84.3)	847 (100)	

Obesity is related to life expectancy				
No, n (%)	79 (18.8)	342 (81.2)	421 (100)	0.46
Yes, n (%)	122 (17)	595 (83)	717 (100)	
Obesity affects mental condition				
No, n (%)	145 (19.1)	615 (80.9)	760 (100)	0.08
Yes, n (%)	56 (14.8)	322 (85.2)	378 (100)	
Obesity affects social life				
No, n (%)	142 (19.4)	591 (80.6)	733 (100)	0.04*
Yes, n (%)	59 (14.6)	346 (85.4)	405 (100)	
In sports, obese people				
Be as good as anyone can be, n (%)	101 (19.6)	413 (80.4)	514 (100)	0.11
Never be good at any sports, n (%)	100 (16)	524 (84)	624 (100)	
Ideal body image				
Incorrect, n (%)	32 (13.1)	212 (86.9)	244 (100)	0.04*
Correct, n (%)	169 (18.9)	725 (81.1)	894 (100)	

* *P* value <0.05 is considered significant.

The association between self-perception and BMI among 2 countries was reported in Table 2. Out of 21 self-perception variables assessed, the bivariate analysis found 10 self-perceptions associated with BMI ($p < 0.05$): self-perception of desire to lose weight, reason to lose weight for appearance, reason to lose weight for better health, reason to lose weight for better well-being, reason to lose weight to fit the clothes, obesity might be treated by hospital, clinics, and specialist, obesity is related to degenerative disease, obesity affects mental condition, and ideal body image.

From 201 overweight teenagers, the proportion was more common in teenagers who had self-perception of desire to lose weight (86.7%) than those who did not have self-perception of desire to lose weight (15.5%). Current study also found that the proportion of overweight teenagers was higher among teenagers who had reason to lose weight for appearance (58.7%) and for better health (68.7%) compared to those who did not have reason for appearance (41,3%) and for better health (31,3%). However, teenagers who did not have reason to lose weight for better well-being, to get in shape, and to fit the clothes were more common in overweight teenagers. Seventy percent of overweight teenagers assumed that the role of genetics in obesity is important than

other assumption, however, this difference was not statistically significant ($p = 0.20$).

When compared with overweight teenagers, non-overweight teenagers had more self-perception that diet and exercise might induce weight loss (83.4%) than overweight teenagers (16.6%). Regarding the management of obesity, the perception that obesity might be treated was mostly owned by non-overweight teenagers than those who were overweight, treated by hospital, clinics, or specialists (87.2%), by general practitioners (84.9%), dietitians/ nutritionists (83.3%), social workers (85.7%), individual efforts (82.6%), bariatric surgery (84.6%), and prescribed drugs (86.1%). Of the 7 self-perceptions related to obesity management, the variable statistically associated was only obesity might be treated by hospital, clinics, or specialist ($p < 0.001$).

Other perceptions also showed that non-overweight teenagers had more self-perception that obesity is related to degenerative disease (84.3%), obesity is related to life expectancy (83%), obesity affects mental condition (85.2%), and obesity affects social life (85.4%) compared to those who were overweight. However, the variables statistically associated were self-perception of obesity is related to degenerative disease ($p = 0.003$) and obesity affects social life ($p = 0.04$). Self-perception that in sports,

obese people could be as good as normal people showed there was no significant difference, both in teenagers who were overweight and not overweight ($p=0.11$). Most teenagers who were

overweight and not overweight had the correct perception regarding ideal body image and it was statistically significant ($p=0.04$).

Table 3. Multivariable Logistic Analysis of Actual BMI based on Self-Perception

Self-Perception	Category	OR (95% CI)	P value
Desire to lose weight	No	6.37 (4.1-9.9)	<0.001*
	Yes		
Reason to lose weight for better health	No	2.26 (1.59-3.21)	<0.001*
	Yes		
Diet and exercise might induce weight loss	No	1.67 (1.11-2.5)	0.01*
	Yes		
Obesity might be treated by hospital, clinics, or specialists	No	1.84 (1.29-2.63)	0.001*
	Yes		
Obesity is related to degenerative disease	No	1.57 (1.09-2.25)	0.01*
	Yes		

* P value <0.05 is considered significant.

The multivariable logistic analysis is shown in Table 3. From 10 self-perceptions associated with BMI in bivariate analysis, the multivariable analysis found 5 associated self-perceptions: desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight loss, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease.

From this result, investigators concluded that self-perception of desire to lose weight was a variable with major contribution to actual BMI among teenagers. Teenagers who did not have self-perception of desire to lose weight were 6.37 times more likely to have overweight than teenagers who had self-perception of desire to lose weight.

This research was trying to explore the relationship between self-perception and actual BMI of teenagers in Indonesia and Taiwan. The data was collected from 1,138 11th graders spreading across 13 different schools in Indonesia and Taiwan. The average respondents age was 15.79 (± 1.48) years old. There were 53.7% male teenagers and 527 female teenagers with average BMI of 21.07.

Bivariate analysis showed that there was significant difference between categories of BMI in Indonesia and Taiwan ($p<0.001$), but no different in numeric BMI. In Indonesia, most

of teenagers were underweight and normal. On the other hand, most teenagers in Taiwan were normal and overweight. The questionnaires containing 21 self-perception variables, in which 10 self-perceptions associated with BMI ($p<0.05$): self-perception of desire to lose weight, reason to lose weight for appearance, reason to lose weight for better health, reason to lose weight for better well-being, reason to lose weight to fit the clothes, obesity might be treated by hospital, clinics, and specialist, obesity is related to degenerative disease, obesity affects mental condition, and ideal body image. The 10 self-perceptions then analyzed by using logistic regression. It has 5 associated self-perceptions: desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight loss, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease. The desire to lose weight was a variable with major contribution to actual BMI among teenagers, if teenagers did not have self-perception of desire to lose weight, they will be 6.37 times more likely to be overweight.

Result of this research is consistent with the results of another study proving that eating behavior and physical activity are thought to be the main triggers of the high prevalence of teenagers obese teenagers (Mahdiah et al.,

2004). Another study showed that obesity and stress could trigger hypertension (Korneliani & Meida, 2012). The results of data analysis showed that there was a relationship between central obesity with total blood cholesterol levels (Listiyana et al., 2013). In addition, environment factors such negative social support and stigma received resulted in psychological impact and less interactions (Muharry & Kumalasari, 2018). The study of the Gene-Environment Interaction (GEI) has shown that heritability had an impact on both monogenic and polygenic obesity. It provided convergent evidence wherein obesity-predisposition genes interact with various environments, lifestyle and exposure treatment (Reddon et al., 2016). Interventions with lifestyle approaches consisted of the promotion of healthy lifestyles, nutritional counseling, physical training, and behavioral change improved weight loss and reduced risk factors for cardiovascular disease (Galani & Schneider, 2007; Kurnia et al., 2018).

This research had different approach in understanding the nature of body weight and BMI. This uniqueness made it possible to conclude that self-perception played an important role in the actual BMI. Those with good self-perception of their own weight will be less likely to be overweight or obese. Differences in race, ethnicity, and tradition will result in differences in health treatment and health care which will shape different perception (Horowitz et al., 2000). This study combined data of Taiwanese and Indonesian teenagers, which showed that the shared culture shaped nearly similar self-perception. Correct perception of obesity will help teenagers to lose their weight (Yang et al., 2014).

Obese people tend to watch more television and rarely have a physical activity or in other words have a sedentary lifestyle (Cameron et al., 2003). The habits of Indonesian teenagers who watch shows on TV during their free time and idolize popular artists who influence perceptions related to obesity and activity. In line with the results of research which states that various online media such as advertisements and public figures provide the dogma that the ideal body is slim and thin so that it can influence people's perceptions about obesity (Faccio, 2013). Good community

perceptions about ideal body shape will motivate teenagers to reach a better body goal (Hesketh et al., 2005). The limitation of this research was there were no observations done in rural environments. This made the result of this research limited only to urban teenagers.

Conclusion

There were no significant differences in BMI between Indonesian and Taiwanese teenagers, but there was a significant difference in BMI categories. Most Indonesian teenagers were categorized as underweight and normal, where as Taiwanese teenagers categorized as overweight and normal. The desire to lose weight, reason to lose weight for better health, diet and exercise might induce weight lose, obesity might be treated by hospital, clinics, or specialist, and obesity is related to degenerative disease were significant perceptions affecting the actual BMI. Teenagers with no self-perception to lose weight will be more likely to developed overweight than their counterparts. It is important to include the rural areas for the future research.

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Implementation of Covid-19 Health Standard at Elementary School in Yogyakarta

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Abstract

In the era of Covid-19 and the implementation of the new normal, schools have a difficult task because schools not only strive to continuously improve students' academic abilities but must follow the basic principles of always keeping students, teachers and other staffs healthy and safe when they are at school. At the same time they must participate in helping the government in stopping the spread of the Covid-19. This study aims to describe the implementation of ventilation, duration and distance at schools; Educational Information Communication/EIC media; availability of Personal Protective Equipment/PPE; the availability of Covid-19 prevention facilities; and the level of knowledge of school staff and students regarding the prevention and handling of Covid-19 at schools. This study uses a qualitative descriptive research design. From the results of the study, it can be seen that school staff and students have a good level of knowledge regarding the management of prevention and handling of Covid-19 at schools and schools have implemented ventilation standards, duration, distance well too. However, the availability of EIC media, PPE and the availability of Covid-19 prevention facilities in schools are not in accordance with the expected standard.

Introduction

Schools closing globally in response to the Covid-19 pandemic present an unprecedented risk to education, protection and welfare of children (Unesco, Unicef, The World Bank, WFP, & UNHCR, 2020). Before schools reopen face-to-face meetings, schools need to prepare policies, procedures, and planning, the financing needed to improve the quality of education, by focusing on safe activities, including strengthening learning practices at home (Unesco et al., 2020). In addition, schools also need to assess student needs including students with disabilities, especially for continuing education, as well as develop strategies to address needs when face-to-face learning is suspended or when students need to self-isolate as a result of being diagnosed or infected with Covid-19. Several

studies show that children under the age of 18 represent about 8.5% of reported Covid-19 cases, with relatively few deaths compared to other age groups. However, the incidence of critical cases due to this disease in children has also been reported (Unicef, Unesco, & WHO, 2020). Therefore, children and adolescents must understand the basics information about Covid-19, including symptoms, complications, spreading and prevention the spread of the disease. The information provided must be in accordance with the child's age grouping, for example Kindergarten, Elementary School, Junior High School and High School students (Unicef, WHO, & IFRC, 2020).

In the era of Covid-19 and the implementation of the new normal, schools have difficult tasks, among others, they must follow basic principles in order to help keeping

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students, teachers and other staff safer while they are at school and assist the government in stopping the spread of the Covid-19 disease. In addition, schools must also know the latest facts and information regarding Covid-19, including symptoms, complications, spread and prevention of spread; ensure that the operations or activities carried out at the school remain safe; establish procedures if there are students or staff who are sick; promote and share information regarding the latest pandemic situation; adapting school policies to suit current conditions, such as flexible attendance and sick leave policies; monitoring the existence of students, teachers and staff; implementing education or knowledge about disease prevention and control in daily activities and during learning activities; and providing psychosocial/mental health support if needed (Unicef, WHO, et al., 2020).

Starting in 2017, Elementary School X is one of the inclusive elementary schools in Yogyakarta Province, namely the Elementary School which has several children with special needs and this Elementary School is also located in a disaster-prone area, namely in Bantul Regency, Yogyakarta. Elementary School X has a vision to create a generation that is pious, intelligent, noble and cultured. Being cultured here can be interpreted broadly, including having a healthy and safe culture. Meanwhile, the mission of this elementary school is to familiarize students with healthy behavior in everyday life. However, in real conditions, this Elementary School still has very little exposure to information and training either to school staff (principals, teachers, administrative staff and school guards/security/school cleaning personnel), students or representatives of parents/school committees related to safety education for children and prevention of Covid-19 in schools, so the role of teachers is tiny in providing safety education for children in this location. For example, during observations, still found unsafe actions of teachers when interacting and discussing, namely not keeping their distance and lowering or removing their masks. While on the other hand, this elementary school in the last few months has been recorded as being located and surrounded by residents' villages in red, orange

and yellow zones related to cases of Covid-19 cases.

Another problem at Elementary School X related to Covid-19 is the lack of availability of a management system for preventing and handling Covid-19 at schools including SOPs, pocket books, training and other supporting facilities such as the availability of spare thermo guns, backup medical masks at schools, face shields for teachers and staff, soap for hand washing and hand sanitizers at strategic points. To break the Covid-19 transmission line in schools, especially in the face of the plan to reopen face-to-face learning, the purpose of this study is to find out how the description of the application of ventilation, duration, distance in schools; description of the availability of EIC media for Covid-19 prevention in schools; description of the availability of Personal Protective Equipment/PPE; a description of the completeness of Covid-19 prevention facilities in schools related to hand washing, provision of special trash bins and temperature measurement tools; an overview of the level of knowledge of school staff and students regarding the prevention and handling of Covid-19 in schools.

Method

This study uses a qualitative descriptive research design with unit analysis such as (1) the application of ventilation, duration and distance at school; (2) availability of EIC media for Covid-19 prevention at schools; (3) availability of Personal Protective Equipment/PPE; (4) completeness of Covid-19 prevention facilities in schools related to hand washing, provision of special trash bins and temperature measurement tools; (5) the level of knowledge of school staff and (6) the level of knowledge of students related to the prevention and handling of Covid-19 in schools. Data collection in this study was carried out through direct observation, document studies, interviews and filling out questionnaires via Google form to informants. Data were analyzed qualitatively and descriptively through percentages to describe the implementation of health standards in schools. This research was conducted at Elementary School X in Yogyakarta Province, with the key informants

in this study as many as 14 people from school staff consisting of school principals, teachers, school administration staff and school janitors/ staff taken by the total sampling method, plus 5 the students selected by the school with the criteria that these students understand well the Covid-19 prevention efforts carried out in their schools.

Result and Discussion

Elementary School X has a building design with excellent ventilation with an area of more than 20% of the room area with a cross ventilation system. The ventilation system is designed on the right and left sides so that it allows for excellent air movement. On the other hand, the movement of air in the room is assisted mechanically by using a fan with a room door that is large enough and always positioned open, especially during the Covid-19 pandemic, so it can be said that the layout of Elementary School X is very conducive to use during the Covid-19 pandemic. Air quality in classrooms is influenced by ventilation conditions and the accumulation of air pollutants from inside and outside the room. According to SNI 03-6572-2001 concerning Procedures for Designing Ventilation and Air Conditioning Systems in Buildings, natural ventilation can be in the form of permanent openings (at least 5% of the floor area of the room), windows, doors or other suggestions that can be opened. Then according to the Decree of the Minister of Health No. 1429/MENKES/SK/2006 concerning Guidelines for the Implementation of School Environmental Health stipulates the area of ventilation holes to ensure the flow of fresh air in classrooms in the school environment is 20% of the floor area with a minimum class density of 1.75 m² and a ceiling height of at least 3 meters from the floor. In addition, based on Appendix II of Regulation of the Minister of Education and Culture No. 32 of 2011 concerning Standards and Technical Specifications for Rehabilitation of Damaged Classrooms, Construction of New Classrooms and Their Furniture and Construction of Library Rooms and Furniture for Elementary School/SLB stipulates that the opening area is 20% of the total floor area of the building, 6%-10% of the area is ventilation (permanent opening) with the principle of cross ventilation

or one-sided ventilation.

In terms of duration, Elementary School X has also done a good job of limiting the duration, namely limiting the number of face-to-face hours to only 2 hours a day. As for the division of shifts for grades 1, 2 and 6 they enter on Monday, Tuesday and Wednesday from 08.00 to 10.00 West Indonesia Time. Elementary School X does not only limit the duration but also limits the number of students in one class by dividing the number of students in one class into two classes or two groups so that the density of the number of students can be reduced. One large class that contains 21-22 students is only filled with a maximum of 50% of the total number of students. However, for classes with a small number of students, the number of students is not divided, for example class 2 only has 9 students so that in terms of density the number of students is relatively safe in one class because the capacity of students per class in Elementary School X can be used up to 30 students. Therefore, Elementary School X can be said to have not only implemented a duration restriction but also a standard for social distancing in the classroom. In grades 3, 4 and 5, the same pattern is applied, but they go to school on Thursday, Friday and Saturday.

On the standard of distancing, Elementary School X has arranged student seating to maintain a distance between one student and another in Figure 1. The distance from one student to another for the right and left distances between students reaches approximately 2 meters while the distance from one student to other students from the front and back reaches approximately 1 meter. There is no proven treatment or vaccine for Covid-19, the only effective measure available to control the virus and protect public health is to reduce the frequency of close contact between people. Governments around the world have issued unprecedented policies and guidelines to increase social distancing within and across countries. The goal is to save lives by reducing the rate of Covid-19 infections (Thunström, Newbold, Finnoff, Ashworth, & Shogren, 2020).

At Elementary School X, the availability of information communication media for education/EIC media related to efforts to prevent and handle Covid-19 in schools is still

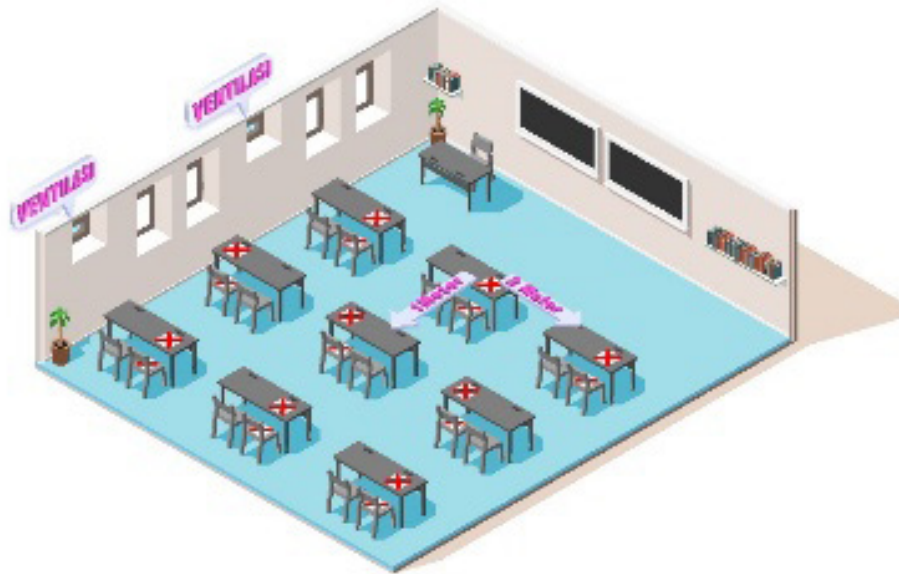


Figure 1. Implementation of Social distancing at school benches in Elementary School X

very minimal. Meanwhile, EIC is extremely important to increase the knowledge of school residents in preventing the emergence of Covid-19 clusters in schools. Therefore, this school still really needs EIC media related to the management of Covid-19 prevention at schools in which informative simple language is easily understood by the target audience, namely Elementary School children and installed in strategic places, easily visible and with an attractive appearance for children. EIC media in schools should cover all aspects of hazards that may threaten the safety and health of children from multi-hazard aspects ranging from infectious diseases, threats of natural disasters, violence against children to all potentials that can cause children to suffer injuries or accidents (Widowati, Istiono, & Sutomo, 2021). In addition, EIC media can also be packaged through educational game media so that children can learn comfortably and fun through the child-friendly media of safety games (Widowati et al., 2018).

Personal Protective Equipment or PPE used by teachers in schools is masks, but in practice there are still teachers who still use masks inappropriately, including masks that are not used to cover the entire nose, mouth

and chin area. It is still found that the use of masks in a drooping position so that they are not able to cover the nose, mouth and chin areas perfectly. During the observation, it was also found that some teachers added their PPE by using a face shield to obtain more optimal protection. But on the other hand, this school does not yet have spare medical mask PPE, so in this aspect of PPE the school still needs the availability of spare medical masks in schools to anticipate if there are students who do not wear masks or dirty masks. The role of wearing masks in children in schools for Covid-19 control must be weighed against the potential hazards, including appropriateness and inconvenience, as well as social and communication issues. Factors to consider also include the age of the group, sociocultural and contextual considerations and the availability of adult supervision and other resources to prevent transmission of Covid-19. The use of masks is increasingly becoming an important part of the national strategy to fight the Covid-19 pandemic. The use of masks is one of the most effective preventive measures to be able to break the chain of transmission carried out by people in the school environment to protect themselves and others from being infected with

the virus, because the use of masks by infected individuals can reduce the risk of transmission, especially because of the high risk of infection of individuals who are infected but asymptomatic (Spitzer, 2020). Therefore, the use of masks has a very positive role and benefit in breaking the chain of spreading Covid-19 in schools (Roy, 2020).

The scope of the completeness of Covid-19 prevention facilities in schools in the study only related to 3 basic facilities, namely hand washing facilities, the provision of special trash bins and body temperature measuring devices. Elementary School X already has 2 hand washing facilities located in the garden area near the class entrance, but these facilities have not been equipped with soap and pictures of washing hands properly and correctly as a medium for educating children to be able to wash their hands properly. In addition, this Elementary School also does not provide hand sanitizers that can be accessed by all school residents. Therefore, this school still needs liquid soap for washing hands and pictures of guidelines for washing hands properly and correctly at the sinks, as well as providing education regarding how to wash hands properly for all school residents and providing hand sanitizers that can be used by all school residents and installed at strategic points that are far from the sink point for washing hands. Availability of adequate school infrastructure and facilities, high commitment, integrative curriculum, good exposure information, good supervision systems and the empowerment of the optimal role of the school community are highly important to create schools that are resistant to multi-hazard threats including the dangers of Covid-19 (Widowati, Istiono, & Husodo, 2021).

In terms of the availability of trash cans, Elementary School X has 3 types of trash bins, namely red for disposal of residues, green for disposing of leaf waste and yellow for disposing of plastic or non-organic waste. However, this school does not yet have a special trash can, namely an infectious trash can, specifically for disposing of used mask waste, making it easier for the cleaning and handling process. Waste management by providing special disposal sites can prevent the spread of SARS-CoV-2,

especially through contact with contaminated surfaces and objects (Mejjad et al., 2021). Improperly disposed masks can be a potential source of the virus if someone comes into contact with them. Poor and inadequate waste management strategies in developing and less developed countries contribute to a higher threat of spreading Covid-19 in society (Shiferie, 2021).

In the aspect of measuring body temperature, since May 2020 Elementary School X has had a thermo gun facility and carried out the process of measuring temperature on students, teachers and school staff before they entered the school area, however, it is still found that temperature measurement practices are not appropriate. Moreover, still found the lack of knowledge regarding the maximum allowable temperature limit and when the measurement is carried out and how the repetition process must be carried out in the process of measuring body temperature if it is necessary to repeat the steps for measuring the temperature. In addition, this Elementary School does not yet have a spare thermo gun so that if tool malfunction happens, the temperature measurement process can still be carried out properly. Therefore, at Elementary School X, adequate training is still needed regarding the procedures for measuring body temperature as well as procuring a spare thermo gun.

The Covid-19 pandemic has caused schools to be prepared with the conditions for implementing the new normal which refers to the education pattern set due to the face-to-face learning process. Facing this, schools need to implement health protocols to break the chain of transmission of Covid-19, one of which is checking body temperature for someone who will enter the school environment. The role of measuring body temperature in breaking the chain of transmission of Covid-19 in schools is a crucial thing that is done before someone enters the school area. If the body temperature is found to be above normal, the officers will not allow entering the school environment. A person with a body temperature above normal should be referred to a community health center or health center for optimal treatment. Therefore, schools should have strict control in breaking the chain of the spread of Covid-19,

one of which is the implementation of checking body temperature every day (S. Y. Cheng, Wang, Shen, & Chang, 2020). The correlation between high temperature and Covid-19 infection is so strong that several governments have implemented screening protocols that involve checking body temperature at school entrances to reduce the risk of transmitting the virus (Piccinini, Martinelli, & Carbonaro, 2021).

Description of the knowledge level of school staff which includes principals, teachers, school administration staff and guards school/school cleaners related to the prevention and handling of Covid-19 in schools carried out on 14 respondents at Elementary School X is in the "very good" category. The average score of school staff knowledge in this study was 96 out of a total score of 100. The level of knowledge is closely related to the education level of the respondent. The education level of respondents at Elementary School is the majority with an undergraduate education. The higher the education, the easier it will be for a person to receive information so that the knowledge he has will increase. In addition, the higher a person's level of education will make it easier for him to gain knowledge which will make his insight wider. Therefore, public knowledge about Covid-19 is a very important aspect in efforts to prevent Covid-19 in the community. The public needs to know the cause of Covid-19, the characteristics of the virus, the transmission process, symptoms, efforts to prevent the disease and terms related to Covid-19, especially in Indonesia which has a special term related to Covid-19.

The description of the knowledge of the school staff regarding what Covid-19 is and how Covid-19 is transmitted, it can be seen that the respondents' answers are very good in explaining what Covid-19 is, the description of the respondents' answers, among others, Covid-19 is a disease caused by the Corona Virus through droplets, close contact and touching contaminated surfaces. However, there were also those who answered that it was due to unsafe behavior because they did not comply with health protocols such as crowding, not wearing masks, not maintaining distance and not washing hands. An overview of

respondents regarding how to break the chain of transmission of Covid-19 at school, in a general context, many respondents said that Covid-19 could be cut off the chain of transmission by complying with health protocols, for example by implementing 3 habits (washing hands, keeping a distance and wearing masks), there are also those who add by spraying disinfectants, not touching each other, exercising regularly and eating nutritious foods. However, in the context of preventing Covid-19, which is more specific, namely in schools, respondents said that the way to break the chain of transmission of Covid-19 in schools is to review the readiness of face-to-face learning by considering the availability of sanitation and hygiene facilities; activation of school health services; apply mask mandatory areas; has a thermo gun for measuring body temperature; make an agreement with the school committee regarding the strategy for implementing health protocols in schools; implementation of shifts during face-to-face learning; arrange the layout of the room; provide good distance signs in classrooms, canteens and prayer rooms; take temperature measurements and if the temperature is above 37.30C or there are symptoms of cough, runny nose, shortness of breath or sore throat, the person concerned is asked to go home. From the respondent's answers, it can be said that the respondent's knowledge of how to break the chain of transmission of Covid-19 in schools is in the "very good" category. Outreach activities related to Covid-19 prevention will be able to increase participants' knowledge. This activity is considered quite effective in educating the community which is marked by an increase in participants' knowledge from "not good" to most of the participants having "good" knowledge. The strategies used in the delivery of extension materials play a very important role in the success of the process of delivering material in an activity.

In addition, the activation of school health services, one of which is through the activation of the School Health Clinic is a health program that is quite strategic to be carried out, because the School Medical Program is implemented at all school levels, where activities consist of health education, health services and fostering a healthy environment in schools. The

primary targets of the School Medical Program are students, educators, teaching staff and the school community. Efforts to maintain health can be started from the school environment that emphasizes behavior change. Therefore, the School Medical Program is important because it includes health education from an early age. School Medical Program it is expected to be able to provide education and socialization so as to increase the frequency of wearing a mask and face shield (personal protective equipment), washing hands with soap or using hand sanitizer in schools, reducing outdoor activities that involve many people in public places, keep the distance, practice cough etiquette habits (cover your nose and mouth with a tissue or cloth) and avoid borrowing stationery from each other.

An overview of respondents' assessments regarding the Covid-19 prevention and handling efforts has been carried out at Elementary School X. Of the total 14 respondents, 9 respondents (64.3%) gave a "good" assessment of the Covid-19 prevention and handling efforts that have been carried out in schools, while the remaining 5 respondents (35.7%) did not give any assessment. The average score obtained from the nine respondents related to efforts to prevent and handle Covid-19 in schools is in a fairly high range, reaching a score between 80 -100. Most of the respondents answered that the efforts generally that have been made by schools in preventing Covid-19 include implementing health protocols through 3 habits, providing masks, providing sinks, hand washing soap and tissues, installing ventilation with good air circulation, spraying disinfectants in the school environment, conducting temperature measurement before entering the school area, it's just that the implementation is not consistent. On the other hand, schools also regulate work schedules and learning schedules, there are efforts in the form of implementing a scheduled WFO (Work from Office) and WFH (Work from Home) work system, implementing online learning systems, while offline methods are only given during special conditions, for example approaching the Final Semester Assessment exam. Furthermore, the school also limits the duration of teaching and learning hours and divides students into several groups or shifts, the school requires students to bring

their own writing utensils and supplies and is not allowed to borrow stationery. Meanwhile, particularly efforts to handle Covid-19 in schools, namely schools have worked together and always coordinated with the local Public Health Center and the Covid-19 task force. If it is found that school residents have been in close contact with Covid-19 sufferers, they are required to immediately self-isolate.

Promotive efforts are able to increase awareness and discipline of a person or community in implementing the Covid-19 health protocol. Increasing the application of science and technology and improving values in the health sector also contribute to efforts to reduce the spread of the Covid-19 virus outbreak (Yunawati, Jafriati, Karimuna, Dewi, & Pratiwi, 2021). On the other hand, providing education related to the implementation of health protocols in the school environment is very useful because it will provide experience for participants and increase participants' self-awareness in implementing health protocols to protect themselves and others. The provision of education resulted in differences in respondent behavior between before and after the implementation of socialization and education activities. At the initial condition, the respondent had not implemented the health protocol in a coherent manner but after being given education, the respondent was able to understand the steps for health protocol correctly, which was shown by demonstrating the respondent's ability to carry out the stages of the health protocol, starting from wearing masks, checking temperature, wash the hands before entering the classroom, keep the distance when entering the classroom, and wash the hands or use hand sanitizer after leaving the classroom and returning to their respective homes with safe behavior (Yunawati et al., 2021).

According to respondents, the efforts to prevent and control Covid-19 at Elementary School X have been quite effective, because they judged that school residents had adhered to health protocols well and had never found a positive case of Covid-19 in residents at this school. In addition, the form of compliance with health protocols in schools can be seen from the fulfillment of supporting facilities and

infrastructure, such as the provision of sinks, hand soap, tissues, hand sanitizers and masks. The fulfillment of these supporting facilities is very important to do to break the chain of transmission of Covid-19 because there is a significant relationship between infrastructure and efforts to prevent and control Covid-19. On the other hand, the implementation of online teaching and learning activities is also quite effective to implement, because one of the efforts to suppress the spread of Covid-19 is to apply online learning rules. Online learning can eliminate physical contact and be able to encourage the emergence of social distancing behavior. Social distancing is a good solution to prevent the spread of Covid-19. This action can also reduce the emergence of mass crowds at schools as happened in face-to-face learning (Stein, 2020).

Expectations and suggestions given by respondents to schools in an effort to break the chain of transmission of Covid-19 in schools, among others, are more consistent in implementing health protocols such as wearing masks, maintaining distance, washing hands with soap, taking body temperature measurements, and routinely carrying out disinfection and intensify cooperation and coordination with the Covid-19 task force. In addition, there is a need for a well-documented or recorded health surveillance system, which can also be done through the development of m-health program because m-health has the potential to not only be used as a health surveillance system but can also be developed to conduct an overall assessment of child safety education. This health surveillance is an important aspect as an anticipatory, preventive and preparedness measure to deal with unexpected things such as a suspected Covid-19 case at school, so this document can be used as an initial guideline for the Covid-19 task force in conducting case tracking. Based on the respondents' answers, it can be seen that the level of knowledge of respondents in providing advice to schools is very good, because all respondents know the basic health standards and protocols that must be carried out. Education, isolation, prevention and supervision of the potential for Covid-19 transmission are important steps in monitoring the transmission of the Covid-19 disease, in

addition to implementing social distancing protocols and wearing the masks (V. C. Cheng et al., 2020; Lotfi, Hamblin, & Rezaei, 2020).

The majority of school staff at Elementary School X has understood the Covid-19 prevention procedures that they must do. Respondents answered that students and teachers should not only be able to understand Covid-19 prevention procedures but also must be able to carry out these procedures, one of which is applying the 4 habits (wearing masks, washing hands, maintaining distance and avoiding crowds). The teacher's role in exemplifying the right behavior and implementing the correct Covid-19 prevention procedures for students as well as integrating Covid-19 prevention materials into teaching materials and student assignments is important to support the implementation of preventing Covid-19 spreading in Indonesia. The application of the 4 habits as a factor in reducing the spread of Covid-19, including the importance of personal hygiene (Yousuf et al., 2020). In the view of school staff, the description of good practices that have been carried out by teachers and students in efforts to prevent Covid-19 in schools, among others, teachers and students have implemented health protocols while at school, namely by wearing masks, washing hands, maintaining distance and avoiding crowd; taking body temperature measurements before entering the school area; application of online learning to avoid direct physical contact when at school; regular disinfection; arrangement of the layout in the classroom and the arrangement of learning shifts have also become one of the important efforts that have been made by the school. Based on the answers of the respondents, it can be seen that the knowledge and understanding of school staff regarding the implementation of health protocols is very good. Discipline of teachers and students as well as the role of the government in supervising health procedures is very much needed in an effort to break the chain of the spread of Covid-19.

In general, the average student knowledge related to Covid-19 and its prevention is in the "very good" category as presented in Figure 2. Based on Figure 2, it can be seen that the average result of 5 students at Elementary School X is 754

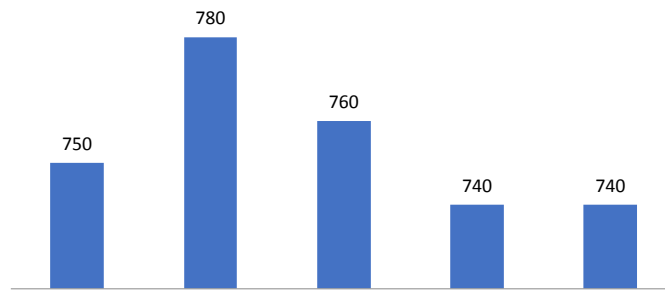


Figure 2. Results of the Score of Students' Knowledge Level

from a maximum score of 800. An overview of student knowledge regarding what Covid-19 is, it appears that almost all respondents (students) understand that Covid-19 is a dangerous and infectious disease caused by the Corona Virus. This can be seen from their answers, most of which said that Covid-19 was an outbreak of an infectious disease caused by the Corona Virus. Based on the respondents' answers, it can be concluded that the respondents have a very good understanding of what Covid-19 is. An overview of student knowledge regarding how Covid-19 is transmitted, it appears that 40% (2 people) have understood that Covid-19 is a disease that is transmitted through droplets that come out when sneezing, coughing or talking. From the students' answers, it was known that there were only 2 people who specifically mentioned that Covid-19 was transmitted from one human to another through splashes of liquid originating from the respiratory tract and mouth, such as droplets that come out when coughing or sneezing, which are referred to as droplets. Other respondents only mentioned the transmission of Covid-19 through the air and direct contact with sufferers. Based on the respondents' answers, it can be concluded that students' understanding of Covid-19 transmission is in the "very good" category. The description of student knowledge regarding what must be done to break the chain of transmission of Covid-19 in schools, it appears that all students understand what must be done to break the chain of transmission of Covid-19. This can be seen from the answers

of the respondents, such as to break the chain of the spread of the Covid-19 virus, what must be done is to comply with health protocols, namely: diligently washing hands with soap, maintaining distance, wearing masks and avoiding crowds. While the description of student knowledge regarding what schools have done for the prevention and handling of Covid-19 in schools, it can be seen that according to respondents, their school have implemented health protocols well in the context of preventing and handling Covid-19. Their schools already have hand washing facilities, apply social distancing standards, have mandatory wearing masks and apply online learning.

The description of student knowledge regarding the assessment of the effectiveness of the efforts that have been made by schools in preventing and handling Covid-19 shows that according to 4 respondents (80%), the efforts to handle Covid-19 carried out by schools have been effective because they are in accordance with the health protocol recommended by the Indonesian Government. While 1 other respondent (20%) believes that the handling efforts carried out by schools have not been fully effective because efforts to prevent Covid-19 in schools have not been followed by the implementation of strict school standards so that students' academic output/ability does not decrease due to the implementation of online learning. The description of students' knowledge regarding what suggestion they give to schools in an effort to break the chain

of transmission of Covid-19 in schools, it appears that respondents already have a good understanding of the implementation of health protocols so that they are able to provide good advice to schools, namely asking schools to more consistent in implementing health protocols in the school environment, such as: taking body temperature measurements on all students and school staff, wearing masks, keeping a distance, frequently washing hands and asking the school to advise sick students not to go to school first.

An overview of student assessments regarding whether according to students all teachers and students have understood the preventive procedures they must do to break the chain of transmission of Covid-19 in schools, it appears that all respondents said that most of the teachers and students in their school environment had implemented and comply with the health protocols that apply in their schools, for example: students and teachers always wear masks when at school and wash their hands frequently. Therefore, it can be concluded that according to students' assessment the implementation of the protocol in the school environment is "good". An overview of students' knowledge regarding the description of good practices that have been carried out by teachers and students in efforts to prevent Covid-19 in schools, respondents explained that the good practices that teachers and students have taken to prevent Covid-19 in schools include: restrictions on the number of students who must come to school, the application of online learning, the application of social distancing, the obligation to wash hands/use hand sanitizers and the obligation to wear masks. Therefore, it can be concluded that the good practices carried out by teachers and students in the effort to prevent Covid-19 in schools "have been very good". To be able to solve the Covid-19 problem, continuous professional education is needed to increase knowledge and change negative attitudes, as well as improve good practice in prevention and handling efforts.

COVID-19 pandemic has forced many children around the world to spend time at home. Parents and caregivers take many responsibilities for educating children (Zhang, 2021). Several new support strategies have

emerged during this pandemic, but there is no measure of their effectiveness yet (Marques de Miranda, da Silva Athanasio, Sena Oliveira, & Simoes-e-Silva, 2020). The paradigm of planning and reducing disaster risk with the All-Hazards Approach (AHA) framework which prioritizes mitigation according to the likelihood and severity in each local context is also something that can be considered (Peleg, Bodas, Hertelendy, & Kirsch, 2021). Not only at the planning level but simulations are also very much needed as part of a preparedness strategy to ensure that simulations are effective in bringing about changes in practice to improve preparedness in this pandemic era (Reddin, Bang, & Miles, 2021). COVID-19 should not be a global public health disaster. Many factors can be related to its spread, including environmental factors, personal factors, obedience factors in wearing masks and special condition factors (Kwok, Yan, Huang, Gao, & Li, 2021). Sanitary measures, cleaning their hands with soap and water, limiting any movement inside and outside the home are deemed important measures to limit the spread of this disease (Madan, Bindal, & Gupta, 2021). However, some groups appear to be more vulnerable to the mental health burden of the COVID-19 pandemic, so mitigation actions should also prioritize them. Schools have an important role to play in prioritizing mitigation actions aimed at saving children not only from cases of COVID-19 but also to help them deal with the mental health burden of this pandemic (Marques de Miranda, da Silva Athanasio, Sena Oliveira, & Simoes-e-Silva, 2020).

COVID-19 has become a pandemic and the perception of risk plays an important role in self-protection and prevention of spread (Chen, Feng, Chen, Lee, & An, 2021). The pandemic has not only significantly reduced student mobility but also shifted the flow of student mobility, especially international students (Mok, Xiong, Ke, & Cheung, 2021). One of the challenges faced by principals and teachers is especially related to distance learning programs (Constantia, Christos, Glykeria, Anastasia, & Aikaterini, 2021). The concept of blended learning, a combination of online and face-to-face learning, has become popular in educational circles (Ashraf, Tsegay,

& Meijia, 2021) including the selection of digital content, which currently still has gaps, is also an important issue that has been addressed in the world for decades (Zhong, Zhu, & Xia, 2021) although people's fears seems to be increasing with misinformation being spread across all types of media, particularly on social media (Superio et al., 2021).

Online teaching has been carried out on a large scale during the novel coronavirus period all over the world (Zou, Huang, Ma, & Qiu, 2021). This is done to prevent the transmission of COVID-19, all educational institutions are closed and it is recommended to switch to online learning (Twinamasiko et al., 2021). Current schools have been able to respond quickly to changing circumstances and continue to provide education to their students without interruption, albeit with a different approach (Ermenc, Kalin, & Mažgon, 2021). Including adjusting the appropriate system/curriculum design will help remove barriers and help Students with Disabilities to be able to access e-learning during the pandemic (Mohammed Ali, 2021). Preparedness through EWS/Early Warning System to help reduce the future wave of COVID-19 is a strategic thing that must be considered (Fearnley & Dixon, 2020). Multi-hazard application system (Dallo & Marti, 2021) and social media can also be used as a way to build a disaster preparedness system in the future (Sakurai & Adu-Gyamfi, 2020).

Conclusion

Elementary School X has implemented ventilation standards, duration and distance well. However, the availability of EIC media for the prevention of Covid-19 is still very minimal at the schools. From the aspect of PPE, it is known that all school residents have used PPE in the form of masks and some have added their PPE by using face shields, but there are still practices in using masks that are not correct, namely not covering the nose, mouth and chin areas perfectly. In addition, the school does not yet have a spare medical mask as anticipation for those who do not wear it when going to school or any kind of barriers. Regarding the completeness of the Covid-19 prevention facilities in schools, the

school already has a hand washing place even though when the observation was carried out the sink was not equipped with liquid soap for washing hands and was not equipped with pictures of instructions on how to wash hands properly for Elementary School students. In addition, the school also has not provided a special trash can for disposing of used masks and the school has not carried out special procedures for handling used mask waste in schools. Regarding temperature measurement, before school residents enter the school area, all school residents have their body temperature measured, but the school does not yet have a backup temperature measurement tool to anticipate if the existing tools cannot be used, in addition to understanding the procedure for measuring temperature is also not fully understood by the officers at that school. For the level of knowledge of staff and students, it can be seen that school staff and students have a good level of knowledge regarding the management of Covid-19 prevention and handling in schools.

The suggestion given in this study is that schools still need written SOP related to the management of prevention and handling of Covid-19 and need a pocket book to guide school residents in good daily behavior to ensure consistency in the implementation of good practices related to Covid-19 prevention at school. Ideally, the pocket book given should contain at least two major aspects, namely the aspect of school safety during the opening of schools during the Covid-19 pandemic and aspects of Occupational Safety and Health (OSH) as a workplace during the Covid-19 pandemic.

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