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An Overview of Integrated Health-Nutrition Service and Characteristics of Volunteer Health Workers: A Study in West Java, Indonesia

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Abstract

Background: The stunting problem is still a concern and priority for WHO and countries in the world, including Indonesia. The Integrated Health-Nutrition Service in Indonesia (called Posyandu) is the closest unit to reach the community through nutrition education and health services. This study aims to analyze volunteer health workers' characteristics and obtain an overview of Posyandu services during the Covid-19 pandemic. This study was conducted in Cirebon Regency, West Java, Indonesia. The study design used was cross-sectional. The respondents were selected purposively. The collected data includes the age, education level, working period, incentive received, participation in nutrition training, the procedure of Posyandu during the pandemic, nutritional knowledge and attitude, food habits, and household food security. The study results showed that most of the volunteer health workers aged 26-35 years with educational level from primary to high school graduates. The mean of working period was four years and receiving incentive US$2/month. In addition, most of the Posyandu were not in operation due to the Covid-19 pandemic conditions. Nutritional knowledge and attitudes of volunteer health workers were mostly high. More than half of the volunteer health workers' households were food insecure. Conclusion: the educational levels and nutritional knowledge of Posyandu's volunteer health workers were high, but their food security were still low. During the Covid-19 pandemic, Posyandu was not in operation. Alternative solutions to support household food security could be through utilizing the home garden for plant crops.

Keywords: Volunteer health workers; Food Habit; Food Security; Nutrition Education; Posyandu.

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1. Introduction

The problem of stunting in children under five is still the focus of global nutrition problems, especially in developing countries, including Indonesia. The high prevalence of stunting in the world has prompted the World Health Organization (WHO) to reduce stunting rates in the world as the first goal of the Global Nutrition Targets of 2025. In Indonesia, the national prevalence of stunting among children under five has remained high in the past ten years. Based on Basic Health Research results in 2018, the prevalence of stunting in Indonesia was 30.8% [1]. Several studies have been conducted to identify the etiology of the occurrence of stunting. Frongillo found that the primary causes of stunting are intrauterine growth retardation, lack of nutrition to promote the fast growth and development of infants and young children, as well as recurrent infections. These findings indicate that the prenatal period or maternal pregnancy period until the child reaches five years old is crucial in fulfilling children's nutritional intake [2]. The importance of paying attention to the nutritional intake of mothers and children during this period must be supported by food security at the household level. Food insecurity can occur due to low purchasing power, limited ability to access food, and the limited ability of households to develop their potential through micro-businesses [3]. Therefore, it is necessary to have support from the government and various stakeholders to increase household capacity to achieve food security levels. Posyandu, an acronym for Pos Pelayanan Terpadu (Integrated Health-Nutrition Service), is the closest unit to the community of Indonesian in obtaining health/nutrition services, especially for infants, toddlers, pregnant women, post-partum mothers, breastfeeding mothers, and couples of childbearing ages. The Posyandu management and implementation system is carried out from, by, and for the community, represented by Posyandu volunteer health workers [4]. Training that is relevant to the function of volunteer health workers can effectively increase the knowledge and skills of volunteer health workers in carrying out their duties to educating the community [5,6]. The purpose of this study was to obtain an overview of Posyandu services during the Covid-19 pandemic and analyze volunteer health workers' characteristics. The results obtained in tshis study are expected to become a reference for the government and stakeholders to take concrete steps to prevent and overcome stunting in the local area.

2. Materials and Methods

2.1. Study Design and Samples

The research design used was cross-sectional. Cirebon Regency, West Java-Indonesia was chosen as the study site because of the high prevalence of stunting. The respondents were selected purposively. The number of respondents selected was 41 people who served as volunteer health workers at the local Posyandu.

2.2. Data Collection

The data collection method was a questionnaire-based interview conducted by enumerators (undergraduate students and graduates of Nutrition Science). The collected data includes the characteristics of volunteer health workers (age, education, length of service as a volunteer health workers, incentives, and participation in nutrition training activities), the procedure of Posyandu during the pandemic, knowledge and nutritional attitudes, food habits, and household food security. *Knowledge and nutritional attitudes of the volunteer health*

workers were measured using questions related to basic nutrition, eating habits of children under five, sanitation and hygiene, breast milk and complementary feeding, nutrition during pregnancy, and stunting. After the knowledge and attitude scores were calculated, they were then categorized into two groups based on the number of correct answers, namely above and below the average score. HFIAS (Household Food Insecurity Access Scale) is used to identify household food security levels by measuring the household perceptions or experiences related to food access. This method has been validated in several countries, such as the Philippines, Bangladesh, Costa Rica, Brazil, Tanzania, Burkina Faso, and Ethiopia [7]. The validation of this method has also been carried out in Indonesia and has proven to be sensitive in measuring household food insecurity. HFIAS is also considered a relatively easy and practical method in collecting data [8]. There are 13 questions asked in the HFIAS domain. The respondent must answer each question with the options of no, rarely (1-2 times in 1 month), sometimes (3-10 times in 1 month), and often (>10 times in 1 month). Each option is assigned a score of 0, 1, 2, and 3. Afterward, each score is summed and categorized. If the total score is 0-1, then it is categorized as food secure, 2-7 for mildly food insecure access, 8-14 would be moderately food insecure access, and 15-27 classified into the severely food insecure access [9].

2.3. Statistical Analysis

Descriptive data processing was done by calculating the mean and standard deviation for the variable of volunteer health worker's characteristics and the HFIAS score using the Statistical Package for Social Sciences (SPSS) 23.0 program.

2.4. Ethnical Approvals

Ethical approval was obtained from the Human Research Ethics Committee of the IPB University No. 295/IT3.KEPMSM-IPB/SK/2020. The study's purpose, procedures, data confidentiality, and freedom to participate or withdraw from the study were explained to all participants during recruitment.

3. Result and Discussion

3.1. Primary Health Care in Indonesia

In Indonesia, Primary Health Care (PHC) has three main strategies, including multisectoral cooperation, community participation, and application of technology according to the needs of the community. The implementation is carried out at the Puskesmas (Public Health Center) in the districts and a network that is based on the community and its participating society, namely Poskesdes (Village Health Post) and Posyandu (Integrated Health-Nutrition Service) that exist in the villages [10]. Posyandu was formed by the Indonesian government as a community-based health effort. The forming of Posyandu aims to bring health services closer to the community by implementing self-management by the community. Posyandu operations on a broader reach are intended to reduce maternal mortality, infant mortality, and under-five mortality rates [4]. According to data from the Indonesian Ministry of Health in 2019, the number of active Posyandu in Indonesia was 188,855, with the ratio of Posyandu to the number of children under five being 1:126 [11]. Posyandu's work scope in the field of Mother and Child Health includes determining the growth status, guidance and counseling,

health checks, detection of growth and development, immunization, Food Supplementation Program, vitamin A and Fe tablets supplementation [12]. The Posyandu implements a five-table system consisting of table 1 for registration, table 2 for weighing, table 3 for filling out Health Card, table 4 for counseling, and the last table for health services. In its process, it takes at least five volunteer health workers to fill the functions of each table. Volunteer health workers carry out the functions in tables 1 to 4. Meanwhile, the health service function at the fifth table is carried out by the volunteer health workers together with the village midwives. The Posyandu volunteer health workers work voluntarily and have time to organize the Posyandu activities held once a month [12]. Volunteer health workers are responsible at the time before, during, and outside of the workday of the Posyandu. The function of the volunteer health workers includes the preparation of Posyandu activities, the implementation of a five-table system, as well as data processing and evaluation of participant's data. Health workers from the Puskesmas foster volunteer health workers in carrying out their duties. Puskesmas is a primary health service unit at the subdistrict level and is also tasked with providing technical medical guidance to Posyandu. The Puskesmas health workers appointed to provide assistance and guidance to the Posyandu are the Nutrition Counselor or village midwives [12]. Posyandu activity is usually scheduled for once a month. The coverage of the Posyandu's working area may include the village or hamlet level, adjusted according to the needs of the community and the resources that they owned. Posyandu financing can come from various sources, such as social funds (fees for Posyandu users, contributions from the community, or donations), the private sector, business profits, or the village government [12].

3.2. Respondent Characteristics

Table 1: Characteristics of Posyandu's volunteer health workers

Characteristics	**n**	**%**
Age (year)		
≤25	5	12.2
26-35	17	41.5
36-45	14	34.1
>45	5	12.2
Mean±SD (year)	34.4±7.1	
Level of Education		
Elementary School	12	29.3
Junior High School	14	34.1
Senior High School	15	36.6
Working duration as volunteer health workers (year)		
<2	9	22.0
2-3	12	29.3
4-5	9	22.0
>5	11	26.8
Mean±SD (year)	4.0±3.2	
Receiving fee as volunteer health workers		
Yes	34	82.9
No	7	17.1
Mean±SD (US$/month)	2.2±0.9	
Participating in nutrition and health training in the last 6 months		
Yes	17	41.5
No	24	58.5

This study involved 41 Posyandu volunteer health workers, mostly aged 26-35 years (41.5%). The education level of the volunteer health workers varied between primary school graduates (29.3%), junior high school (34.1%), and high school graduates (36.6%). Membership of volunteer health workers is voluntary, so the volunteer health workers' work period varies from less than two years to more than five years. According to research by Afifa, the length of career as a volunteer health workers does not affect their performance if it is not supported by a continuous increase in knowledge and skills [13]. Optimization of volunteer health workers performance needs to be supported by providing training by authorized health personnel, carried out regularly and continuously [6]. Besides, commitment and motivation also positively influence the performance of Posyandu volunteer health workers [14].

3.3. Volunteer Health Workers Incentives

Incentives are one of the supporting factors that can increase the motivation and performance of volunteer health workers. Typical forms of incentives are in the form of transportation money, as well as non-money like uniforms, allowances, basic needs, or training [15]. In this study, 82.9% of volunteer health workers received financial incentives to carry out their work with an average nominal value of Rp. 31,294 per month (US$ 2). Mclntyre and his colleagues showed that higher income was associated with lower risk on food insecurity of household [16]. Another finding is regarding the low participation rate of volunteer health workers in training activities in the last six months. The coverage of volunteer health workers who attended nutrition training was only 41.5%, whereas according to Namazzi and his colleagues volunteer health workers training can positively affect volunteer health workers performance [6]. Susanto and his colleagues also stated the same thing in their research. Nutrition training is essential to volunteer health workers so that they can act as health educators and health service providers at Posyandu [17]. Therefore, support from the Public Health Center is needed to pay more attention to providing incentives and training to optimize volunteer health workers performance.

3.4. Running the Posyandu During the Pancemic

The Covid-19 pandemic situation has also influenced Posyandu activities. Based on Table 2, as many as 85.3% of volunteer health workers stated that the Posyandu was not running at all. There are 9.8% of volunteer health workers still carrying out immunization activities without other Posyandu activities. Meanwhile, another 4.8% stated that Posyandu activities were still running but had moved to the village office.

Table 2: Administering Posyandu during the Covid-19 pandemic

Administering Posyandu	**n**	**%**
Closed	35	85.3
Immunization only but other services closed	4	9.8
Posyandu’s venue moves to the village office	2	4.8

The Ministry of Health has regulated health services at Posyandu during the Covid-19 pandemic in the Children Health Service Guidelines during the Covid-19 Pandemic [18]. In areas with Covid-19 cases, they are advised to postpone Posyandu activities as it can cause crowds. Monitoring of children's growth and development is carried

out independently using the Mother and Child Health Handbook. Meanwhile, for areas where there are no Covid-19 cases, the implementation of the Posyandu is determined by their regional head. If it is allowed, it must apply the principle of physical distancing and strictly implement health protocols. If this is not possible, then it will follow the local regulations regarding the Covid-19 case.

3.5. Nutrition knowledge and Attitudes of The Volunteer Health Workers

The results of the analysis of nutritional knowledge and attitudes of the volunteer health workers are presented in Table 3. More than half of the volunteer health workers have a good nutritional knowledge and attitude (68.3% and 58.5%). Mushonga and his colleagues stated a significant relationship between education level with the knowledge of nutrition ($p = 0.028$), meaning that the higher the level of education, the better their nutritional knowledge [19]. Most of the volunteer health workers (36.6%) were educated, and the levels of knowledge and their nutritional attitudes were also high. In addition to education, the volunteer health workers' knowledge of nutritional attitudes can be influenced by the guidance or training related to their duties.

Table 3: Nutritional knowledge and attitude among Posyandu's volunteer health workers

Nutritional knowledge and attitude	**n**	**%**
Nutritional knowledge		
Below mean score (≤72.3)	13	31.7
Above mean score (>72.3)	28	68.3
Mean±SD (score)	72.3±15.6	
Nutritional attitude		
Below mean score (≤82.4)	17	41.5
Above mean score (>82.4)	24	58.5
Mean±SD (score)	82.4±8.2	

Pandemic conditions certainly have an impact on the volunteer health workers' capacity development activities. The requirements for organizing activities involving many people are certainly not easy to be fulfilled. Therefore, it is necessary to have a nutrition training or education method that is more relevant to be applied concerning the current pandemic condition. Perry and his colleagues showed volunteer health workers in low-income countries can make major improvements in health priority areas, including reducing childhood undernutrition, improving maternal and child health and expanding access to family-planning services [20]. A study on the development of android-based nutrition education was conducted by Perdana and his colleagues to determine the effect on knowledge, attitudes, and practices of elementary school students in the application of balanced nutrition [21]. The results showed that android-based education has a positive effect on the knowledge, attitudes, and nutritional behavior of elementary students. The effectiveness of android-based education is also considered better because the medium is perceived to be more comprehensive, edutainment in nature, and relatively easier to access anytime and anywhere by the participants. A pilot study in West Sulawesi, Indonesia, found that volunteers with appropriate and accurate information about health was proven to be effective in changing behaviors of community. Government program to empower community with local health volunteers is

feasible and sustainable [22].

3.6. Volunteer Health Workers Eating Habits

The volunteer health workers' eating habits can provide an overview of the volunteer health workers' nutrition practices related to selecting ingredients consumed by volunteer health workers and their families. Table 4 shows the data on the eating habits of the volunteer health workers in their families. From these data, it is known that half of the volunteer health workers often (3-4 times a week) provide fruit for consumption with their families. The frequency of milk consumption is still inadequate because only 29.3% of the volunteer health workers have gotten used to consuming milk 3-4 times a week. Fish consumption is relatively high with a recurring frequency (3-4 times a week) as stated by 80.5% volunteer health workers, and as many as 82.9% volunteer health workers consume fresh fish more often than preserved fish.

Table 4: Food habits among Posyandu's volunteer health workers

Food habits	**Frequency**	**n**	**%**
I provide fruits for my family consumption.	Often (3-4 times/week)	21	51.2
	Sometimes (1-2 times/week)	20	48.8
My family and I used to drink milk	Often (3-4 times/week)	12	29.3
	Sometimes (1-2 times/week)	29	70.7
I served fish on the family menu.	Often (3-4 times/week)	33	80.5
	Sometimes (1-2 times/week)	8	19.5
We consumed salty fish more frequently than fresh fish.	Yes	7	17.1
	No	34	82.9

Fruit consumption in the community can be influenced by demographic factors and lifestyle characteristics. Households with a high educational background and income tend to consume fruit more often than households with a low educational level and income. The low purchasing power factor can reduce the household's fruit consumption. Likewise, low education will affect the awareness regarding the importance of fruit consumption [23]. A study in Indonesia showed that meat, eggs, milk, and freshwater fish consumption in urban areas are higher, while in rural areas, sea fish and salted fish consumption are higher [24]. Income level and price are considered factors in making food consumption decisions [22,23]. In addition, family members are also determining the food consumption of the household. Research in Vietnam shows that the decision to buy milk in a household is higher if there are children and elders in the family [26].

3.7. Food Security

Table 5 shows that 46.3% of the volunteer health workers' households are in the food secure category. Meanwhile, there are still 14.6% of volunteer health workers households in the severely food insecure access category. The average HFIAS score of the volunteer health workers was 2.9, with a standard deviation of 4.4.

Table 5: Household food security of Posyandu's volunteer health workers

Category of food security (HFIAS score)	n	%
Food secure (score 0-1)	19	46.3
Mildly food insecure access (score 2-7)	7	17.1
Moderately food insecure access (score 8-14)	9	22.0
Severely food insecure access (score 15-27)	6	14.6
Mean±SD (HFIAS score)	2.9±4.4	

In this study, most volunteer health workers chose the "No" option for each indicator. The highest percentage for selecting the "Yes" option is in the indicator of food diversity due to lack of resources. Household food security plays an important role in ensuring a household's nutritional intake, both in terms of quality and quantity. Households in food insecure access can have increase nutritional problems due to lack of access to food [27]. Previous studies in Zambia found that household food security was positively related to several factors, such as security of tenure, land area, and membership of the farmer groups [28]. Meanwhile, another study found that the number of household members and expenditure per capita have a significant relationship with household food security [29]. A study in South Sumatra Province, Indonesia, found that the determinant factor of food insecurity is education. Education plays an essential role in increasing the knowledge and access to information regarding the adequacy of food needs and is also positively related to the welfare of a household. Indirectly, education can have an impact on financial adequacy for household food needs [30].Purnasari and his colleagues conducted a study on household food insecurity in Yogyakarta, Indonesia, by comparing pre-pandemic and pandemic conditions. The results show that household food insecurity has increased from 6% to 11% in pandemic conditions. This increase was triggered by the economic crisis conditions that affected the income, purchasing power, employment status, and medical nature expenses (vitamins, medicines, or sanitizers) [31]. There have been many efforts to achieve food security at the household level. One form of action that has been carried out is by utilization of empty land as a place to grow crops or raise livestock. Apart from being a source of secondary income, this alternative is also useful in meeting the basic daily needs of the household [32]. One of the programs initiated by the Ministry of Agriculture of the Republic of Indonesia in utilizing home gardens is KRPL (Kawasan Rumah Pangan Lestari/Sustainable Community-Based Urban Farming). The program aims to optimize the role of the community in realizing food diversification and increasing household income. KRPL can be implemented by cultivating food crops such as vegetables, fruits, or medicinal plants [33].

4. Limitations of the Study

In this study, the Posyandus involved were not selected randomly because the sampling was based on high stunting prevalence in the village. Moreover, number of posyandus involved were 15 from three villages, while number of villages in Cirebon District were 412 with 2,618 posyandus. Therefore, future study with more samples needs to be done and the role of Posyandu in overcoming stunting problem should be explored comprehensively.

5. Conclusion

In conclusion, nutritional knowledge and attitude of Posyandu volunteer health workers were high, but participation in nutrition training and food security was still low. During the Covid-19 pandemic, Posyandu were not in operation. The author suggests providing training and nutrition education to the volunteer health workers by utilizing digital media so that the capacity building of the volunteer health workers will continue during the pandemic situation. The utilization of the home garden can be a feasible alternative solution to support household food security.

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6. Conflict of Interest

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

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