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Family support for healthy dietary changes in children with obesity: A systematic review

Fonny Veronika Runtulalo*, Sigit Mulyono, Ety Rekawati, Indah Permata Sari

Departemen Keperawatan Komunitas, Fakultas Ilmu Keperawatan, Universitas Indonesia

Corresponding author: *E-mail: fonnyruntulalo78@gmail.com

Abstract

Background: The World Health Organization (WHO) defines overweight or obesity as a condition of abnormal or excessive fat accumulation that can affect a person's health. In Indonesia, children and adolescents have bad eating habits, namely consuming foods and drinks that are high in sugar, salt and fat, eating less vegetables and fruit.

Purpose: To investigate the intervention of family support in dietary adjustments against healthy dietary changes in children with obesity.

Method: The method applied in the article is a systematic review with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). This article analyses the results of different types of studies to provide a more complete and comprehensive picture. Information was collected from Proquest, Pubmed sources published between 2019 and 2023.

Results: The review of 8 articles recommended that family support interventions on dietary regulation on changing healthy eating patterns in obese children as an effective intervention in changing healthy eating habits of obese children.

Conclusion: Family support intervention on dietary regulation on healthy eating changes in obese children as an effective intervention in changing healthy eating habits of obese children.

Keywords: Diet Management; Healthy Eating; Obese Children.

INTRODUCTION

The World Health Organization (WHO) defines obesity as an abnormal or excessive fat accumulation that can affect a person's health. From a study of literature defining obesity as a condition characterized by excessive amounts of fat (Kerns & Fisher, 2020). Obesity is a condition of excessive body fat accumulation caused by imbalanced energy intake and energy expenditure (Ministry of Health of the Republic of Indonesia, 2017). Child obesity in the world has become an epidemic (Guo, Zeng, Zhuang, Zheng, & Chen, 2015). This occurrence of obesity spreads across all age groups in both children, adolescents and adults (Xue, Zhang, Li, Gu, Wang, Chen, Ren, Liu, Chen, Lin, Pan, Zhao, Li, He, & Han, 2021).

According to the WHO, between 1975 and 2016, the prevalence of overweight and obesity in children aged 5-19 increased considerably to more than 18% in 2016 from 4% in 1975 or more than 124 million children and adolescents were obese in 2016. The prevalence increased with age, with preschool children from 2 to 5 about 13.7%, pre-school children from 6 to 11 years of age about 18.7%, and school-age children between 6 and 11 years around 20.6%, while adolescents from 12 to 19 years were about 20.6%. Children's obesity rates ranging from 50 percent are in ten countries: The United States, China, India, Russia, Brazil, Mexico, Egypt, Germany, Pakistan and Indonesia. The high prevalence of

obesity leads to large expenditure of medical and financial resources (Kerns & Fisher, 2020; World Health Organization, 2024).

In Indonesia, according to Basic Health Research of Indonesia results in 2013, the prevalence of obesity among children aged 5-12 was 8.8% (Ministry of Health of the Republic of Indonesia, 2013). And according to the data of Basic Health Research of Indonesia report in 2018, the prevalence of nutritional status of obese among children ages 5-12 years of age is 9.2% (Ministry of Health of the Republic of Indonesia, 2019).

Overweight and obesity are linked to the incidence of non-communicable diseases that are the leading cause of death in the world (World Health Organization, 2023). Studies have shown that people with obesity are at higher risk of developing diabetes, hypertension and heart disease (Zatońska, Psikus, Basiak-Rasała, Stępnicka, Gawel-Dabrowska, Wołyniec, Gibka, Szuba, & Poltyn-Zaradna, 2021).

Overweight and obesity in children who are experiencing an increase has become a significant health problem (Paduano, Borsari, Salvia, Arletti, Tripodi, Pinca, & Borella, 2020). WHO states that children with obesity have a high risk of becoming obese when they become adults. The other impact is that children with obesity will experience difficulty breathing, increased risk of bone fracture, hypertension, showing signs of cardiovascular disease, insulin resistance and psychological effects. A study also found that increased prevalence of overweight and obesity in children has a physical impact on hypertension, chronic infectious diseases, and disease risk factors. The effects on mental health include extortion, discrimination, excluding friends and low self-esteem (Putter, Jackson, Thornton, Willis, Goh, Beauchamp, Benjanuvatra, Dimmock, & Budden, 2022).

Obesity occurs because the calories that come in exceed the ones that are released. Factors that cause obesity in children include genetic factors, activity patterns, and diets (Torizeliaa, Husaini, Triawanti, Panghiyangi, & Noor, 2021). There is a study showing that parents who are obese will have children who are at risk of obesity as well. Childhood obesity is also caused by lifestyle changes, such as reduced physical activity and increased calorie consumption, which leads to energy imbalances. Rather than exercise, children spend an average of about five hours

watching TV, playing video games, and using other kinds of media. Research shows that watching TV for more than five hours a day increases the incidence of obesity. Television advertisements influence children's food choices, the foods that are advertised are of little value (Kerns & Fisher, 2020). A study conducted in China has found that the demand for and purchase of food advertised on television is linked to child food intake, and can increase the risk of child obesity (Xian, Zeng, Cai, Xie, Xie, Sharma, Zhao, & Shi, 2021). Changes in diet also lead to obesity, with children consuming about 700 to 1,000 calories a day, more than the body needs for growth. The size of portions children eat increased, and children eat less vegetables. Besides, a lot of children eat fast food every day, and consume sweetened drinks (Kerns & Fisher, 2020).

In Indonesia, children have bad eating habits, such as eating foods and drinks high in sugar, salt, and fat, eating less vegetables and fruits (Ministry of Health of the Republic of Indonesia, 2017). A study suggests that an unhealthy lifestyle is linked to the incidence of obesity in children. Lifestyles of children who eat in the morning or skip breakfast are at risk of being overweight and obese (Paduano et al., 2020). Other studies also found that obesity is influenced by the presence of foods produced, physical activity, socio-economic, environmental, and genetic factors, so its prevention requires joint efforts by governments, researchers, medical, and social organizations to make dietary and lifestyle change (Guo et al., 2015).

Recommended healthy living habits include eating 5 or more fruits or vegetables, watching TV or other media for 2 hours or less, being physically active for 1 hour or more, and not consuming sweetened beverages (Kaufman, Lynch, & Wilkinson, 2020). In the general guidelines of obesity control according to the Ministry of Health RI, 2015, regulating the energy balance is a principle of management of Obesity. Where the energy coming in must be lower than the energy to be released. This is in line with the WHO recommendations on obesity control by limiting energy intake, increasing the consumption of fruit and vegetables, as well as nuts, doing regular physical activity for 60 minutes a day for children. Dietary settings include the amount of food, type, schedule of meals and processing of food ingredients. The type of food is balanced nutrition, including carbohydrates, vegetables and fruits, proteins, oils, sugars and salt.

Fonny Veronika Runtulalo*, Sigit Mulyono, Ety Rekawati, Indah Permata Sari

Departemen Keperawatan Komunitas, Fakultas Ilmu Keperawatan, Universitas Indonesia
Corresponding author: *E-mail: fonnyruntulalo78@gmail.com

DOI: <https://doi.org/10.33024/minh.v7i3.318>

Strategies that can be used to improve a healthy lifestyle require interventions aimed at parents and children so that healthy lifestyles in early childhood are improved (Paduano et al., 2020). A family is a group of two or more people who are interdependent emotionally, physically, and socially (Stanhope & Lancaster, 2016). According to Ministry of Health RI (2017), the family is the closest person of the family member who has obesity. Families can create situations that can reduce the risk of obesity at home (Fruh, Williams, Hayes, Hauff, Hudson, Sittig, Graves, Hall, & Barinas, 2021) Empowering families to control overweight and obesity in children is the most effective way. With the empowerment of the family, parents have knowledge of nutrition and dietary patterns (Mado, Sirajuddin, Muis, Maria, Darmawansyah, & Arifin, 2021). The role of the family in controlling obesity, among others, the family becomes a role model of healthy living where the family gives an example of good eating, family gives healthy eating habits, breakfast, preparing healthy snacks, vegetables and fruits, and a menu with enough sugar and fat. The family also gives the child the habit of not eating while watching. Besides, families can provide psychological support by encouraging obese family members to live healthy lives (Ministry of Health of the Republic of Indonesia, 2015).

There is a study describes that family-based obesity treatment by conducting interventions that target children and parents with healthy lifestyle interventions such as discussion, role-playing, goal-setting, information about healthy foods, food categories, food labels, trying new foods. Parents acquire the skills of authoritative childcare which means caring persistently and firmly, but at the same time spoiling the child. Also parents get an incentive to behave healthy. Parents also play a role in creating healthy habits from an early age by developing

healthy eating behaviour and physical activity in children. On dietary settings, parents determine the kind of food that is prepared at home. Family support in obesity management interventions on healthy eating sessions resulted in a healthy lifestyle improvement in children (Varagiannis, Magriplis, Risvas, Vamvouka, Nisianaki, Papageorgiou, Pervanidou, Chrousos, & Zampelas, 2021).

The aim of this systematic review is to investigate the intervention of family support in dietary adjustments against healthy dietary changes in children with obesity.

RESEARCH METHOD

The method applied in the article is a systematic review with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). This article analyses the results of various types of research to give a more complete and comprehensive overview. Information collected from Proquest's source, Pubmed, published between 2019 and 2023. The percentage of this article follows the format with the PRISMA stream.

The research process is carried out through several stages as follows: Search for articles using keywords "childhood obesity" AND "diet management" AND "healthy eating pattern", "childhood obesity" OR "child obesity" AND "diet management" AND "nutritional management" AND "healthy eating pattern" OR "healthy eating". The article is searched by filtering the inclusion criteria, selected by reading the title and abstract, then selected the article to be analysed by reading entire article text.

Inclusion criteria: 1) The article is fully accessible, 2) Article with Randomized clinical trial design, 3) Research articles published in the last 5 years (2019-2023) use English, while exclusion criteria: systematic review, meta-analysis articles.

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RESEARCH RESULTS

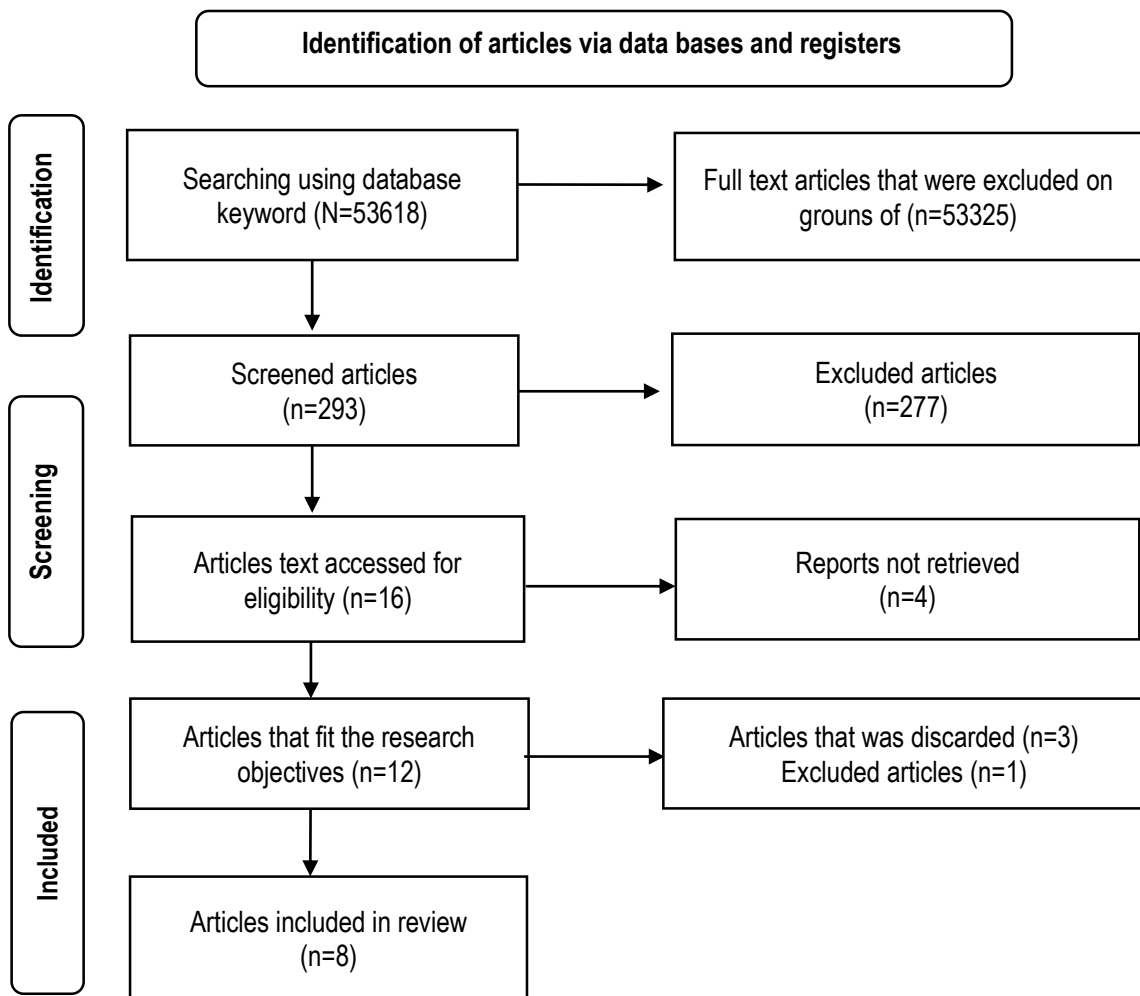


Figure 1. PRISMA Circuit Diagram

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Table 1. The Main Characteristics of Included Studies

Author, Year, Country	Objectives	Design	Sample Size	Output
López-Contreras, Vilchis-Gil, Klünder-Klünder, Villalpando-Carrión, & Flores-Huerta 2020 Mexico	Comparing the eating habits, behavior and metabolic picture of children with obesity to mothers receiving interventions of educational health habits at home with mothers who receive regular nutrition consultations	<i>Randomized clinical trial</i>	177 couples of mothers and children	The mother of an obese child who received an intervention healthy eating habits showed results that her obese son reduced portions of food, and spent food, also showed the presence of substitute food, there was an increase in consumption of non-oiled or fried foods, increased consumption of fruit and vegetables, and in the children of the intervention group there was a significant decrease HOMA-IR (Homeostasis Model to Assess the Insulin Resistance Index). Meanwhile, in the control group, there was an increase in HOMA-IR levels.
Varagiannis, Magriplis, Risvas, Vamvouka, Nisianaki, Papageorgiou, Pervanidou, Chrousos, & Zampelas 2021 Türkiye	Evaluate the effectiveness of three different family-based interventions, namely group-based, personalised and web-based approaches. And aims to explore the differences in factors associated with overweight, obesity in children, including food intake, levels of physical activity, total time watching screens.	<i>Randomized clinical trial</i>		Results from 3 interventions in 3 groups showed significant improvements in weight, BMI, physical activity, viewing time. Total Body Fat (%TBF) is decreasing.
Lyons, Nekkanti, Funderburk, & Skowron 2022 American	Exploring the impact on children whose parents follow the Convident Body Confident Child (CBCC) program, a program designed for parents in promoting a healthy diet and a positive body image in preschool children.	<i>Randomized clinical trial</i>	89 children (58 females and 31 males) from the elderly)	The results showed that children of parents who followed the CBCC program higher body satisfaction. Children of parents using the nutrition manual stronger weight bias. Meanwhile, children of the parents who attended the CBCC workshop lower external food consumption. This study indicates that CBCC can support a healthy diet and positive body image in children.

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Departemen Keperawatan Komunitas, Fakultas Ilmu Keperawatan, Universitas Indonesia
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<p>Lee, Friend, Horning, Linde, Flattum, Lindberg, & Fulkerson 2022 Minnesota</p>	<p>Investigate how family dinner practices affect the quality of diet and weight-related outcomes in both children and parents.</p>	<p><i>Randomized clinical trial</i></p>	<p>There were 114 children between the ages of seven and ten with their parents.</p>	<p>A class called Planful Healthful and frequent family evening meals high scores of routine and dinner planning, as well as more frequent family dinners. Parents in class C3 had a higher consumption of fruit and vegetables, while children in C3 have a lower percentage of body fat compared to other classes. The consumption of fast food in this class is lower.</p>
<p>Wilson, Sweeney, Quattlebaum, Loncar, Kipp, & Brown 2021 African American</p>	<p>How parenting and feeding practices relate to FIT interventions to affect the frequency of family meals in overweight African and American teenagers. Evaluate the effectiveness of weight loss interventions with family motivation and support compared to comprehensive health education controls (CHE)</p>	<p><i>Randomized clinical trial</i></p>	<p>241 couples of parents with obese children aged 11-16.</p>	<p>Increased parenting responsiveness and decreased demands on children from parents receiving Family Improving Together (FIT) interventions are linked to increased frequency of family meals. There is a negative correlation between dietary restrictions by parents and the frequency of meals with the family, as well as a positive correlation between parents' concerns about the child's weight and meal frequencies with families. The results show that more authoritative or supportive kindergarten styles (increased responsiveness and decreased demands) moderate the effect of family-based interventions in increasing the frequency of family meals.</p>
<p>Sirasa, Mitchell, Azhar, Chandrasekara, & Harris 2021 Sri Lanka</p>	<p>Evaluate the effectiveness of Multi Components Interventions (MCIs) on children's dietary diversity and their impact on the food knowledge component and healthy food preferences of children. Interventions include nutrition education for children and nutrition training for parents, food preparation.</p>	<p><i>Randomized clinical trial</i></p>	<p>321</p>	<p>MCI significantly affects the impact of children's dietary diversity by increasing the child's food knowledge score and healthy food preferences.</p>

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<p>Vega-López, Ayers, Gonzalez, Campos, Marsiglia, Bruening, Rankin, Vega Luna, Biggs, & Perilla 2020 USA</p>	<p>Assessed the impact of 10 weeks of parental intervention that simultaneously targeted nutrition and prevention of the use of illicit substances in Hispanic teenagers in primary secondary school. Families Preparing the New Generation Plus (FPNG) intervention is an intervention designed for simultaneously targeting healthy eating and prevention of illicit drug use.</p>	<p><i>Randomized clinical trial</i></p>	<p>239 couples of parents and teenagers</p>	<p>Children in the FPNG+ (Families Preparing the New Generation Plus) group experience increased fruit and fiber intake, and do not experience any change in added sugar intake. Parents who go into FPNG+ intervention tend to increase their intake of fruit/vegetables and whole grains. Involving parents in nutrition and drug use prevention results in positive changes in food intake.</p>
<p>Marques, Ferreira, Santos, Ryal, Marques, Oliveira, & Branco 2023 Brazil</p>	<p>Researched the impact of multi-professional interventions involving families (teens and elderly) compared to isolated interventions (teen without parents) on food processing in overweight adolescents. The study focuses on the type of intervention that affects adolescent food consumption patterns, in the context of the rate of food processing consumed. Interventions include nutrition, psychology and physical education sessions.</p>	<p><i>Randomized clinical trial</i></p>	<p>63 overweight teenagers.</p>	<p>Family interventions and isolated interventions resulted in a significant improvement in the quality of food processing after the intervention period. This means that both types of interventions effectively improve the quality of food in adolescents where there are changes in food consumption before and after the intervention include: consumptions of fresh products in grams increased, processed foods minimized increased and there was a decrease in consumes of processed, ultra-processed food.</p>

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DISCUSSION

Based on studies of eight articles, family support in dietary adjustments to healthy dietary changes in obese children can be done with some of the following intervention strategies:

This strategy is a form of family support in setting a diet in an obese child in which a mother is willing to get a healthy behavioral and nutritional education that is then applied to her child that shows the results of reducing the portion of the diet in a child with obesity, the child can spend the food, the availability of replacement foods, increased consumption of non-oiled or fried food, increase in the intake of fruit and vegetables, making food categories, food labels, trying new foods and preparing foods.

Family support for dietary adjustment in obese children, can also be done with parents' strategies given educational interventions on healthy eating behaviour. This intervention is done on a mother who has an obese child. The results were a reduction in portion of meals in children with obesity, children can spend food, alternative foods are available, increased consumption of non-oiled or fried foods, increase in fruit and vegetable intake, and there is a significant decrease in the HOMA-IR (Homeostasis Model to Assess the Insulin Resistance Index) while in the control group there is an increase in the levels of Homa-IR. The intervention program for the treatment of obesity in children will show effective results with the presence of family support in dietary adjustment when the mother is first educated about healthy eating behaviour (López-Contreras, Vilchis-Gil, Klünder-Klünder, Villalpando-Carrión, & Flores-Huerta, 2020). An interference with Multi Component Interventions (MCI) in which parents preparing meals before getting food preparation and nutrition education significantly affects the impact of children's dietary diversity by increasing their food knowledge scores and healthy food preferences (Sirasa, Mitchell, Azhar, Chandrasekara, & Harris, 2021).

A healthy lifestyle program involves living discussions, role-playing, goal setting, information about healthy foods, food categories, food labels, trying new food, food preparation, behavioral modification and focusing on physical activity through face-to-face contact with the family. Parents are encouraged to acquire authoritative childcare skills that mean nurturing persistently, and firmly, but at the same time defaming the child. Parents determine

the kind of food that will be served at home and give their children the opportunity to be active. By involving parents in obesity management interventions in healthy eating sessions results in a healthy lifestyle improvement in children (Varagiannis et al., 2021). Children in the FPNG+ group (Families Preparing the New Generation Plus) have increased fruit and fiber intake, and do not experience any change in added sugar intake. Similarly with the existence of food processing education in nutrition sessions in parents and children will lead to changes in processing of fresh food and reduce consumption of processed and ultra-processed foods (Marques et al., 2023). The effective nutrition guidelines used by mothers regulate the diet of obese children with the presence of a decrease in external food consumption (Lyons, Nekkanti, Funderburk, & Skowron, 2022).

However, family support intervention strategies against dietary adjustment can also be done with family dinner strategies. In a study conducted by Families Improving Together (FIT) intervention showed that there was a negative relationship between dietary restrictions by parents and the frequency of family meals, as well as a positive relationship between parents' concerns about their child's weight and family meal frequencies. The results show that more authoritative or supportive kindergarten styles (increased responsiveness and decreased demands) moderate the effect of family-based interventions in increasing the frequency of family meals (Wilson, Sweeney, Quattlebaum, Loncar, Kipp, & Brown, 2021). Another study conducted in rural Minnesota showed that the frequency of dinner together increased the consumption of fruit and vegetables in children (Lee, Friend, Horning, Linde, Flattum, Lindberg, & Fulkerson, 2022).

CONCLUSION

Childhood obesity is increasingly prevalent and becomes a public health problem, leading to a higher risk of non-communicable diseases (NCDs) in adulthood in overweight and obese children. Therefore, it is necessary to identify effective interventions against obesity in children, how to perform the best interventions to weight loss in children. Family-based interventions have been recommended to deal with child obesity, as most

Fonny Veronika Runtulalo*, Sigit Mulyono, Ety Rekawati, Indah Permata Sari

Departemen Keperawatan Komunitas, Fakultas Ilmu Keperawatan, Universitas Indonesia
Corresponding author: *E-mail: fonnyruntulalo78@gmail.com

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interventions performed in children with obesity without involving families do not show significant results. With regard to some strategies Family support interventions in dietary setting include: 1) Strategies for dietary adjustment of obese children with mothers getting healthy eating behaviour education programmes: reduction of portion meals in children with obesity, children can spend food, availability of alternative foods, increased consumption of non-oiled or roasted foods increase consumptions of fruit and vegetables, food categories, food labels, try new food, food preparation, 2) Family support strategy interventions with family dinner.

SUGGESTION

Based on the results of the above review, it is recommended that family support interventions in dietary adjustments against healthy dietary changes in obese children be an effective intervention in changing healthy eating habits of obese children.

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Fonny Veronika Runtulalo*, Sigit Mulyono, Ety Rekawati, Indah Permata Sari

Departemen Keperawatan Komunitas, Fakultas Ilmu Keperawatan, Universitas Indonesia
Corresponding author: *E-mail: fonnyruntulalo78@gmail.com

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