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Effect of Maternal Nutrition Education on Knowledge, Attitude, and Practice Related to Infant and Toddler Feeding

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Abstract

This study aims to analyze the influence of maternal nutrition education on knowledge, attitude, and practice of infant and toddler feeding in a community feeding center in Sedayu Subdistrict, Bantul District, Yogyakarta. A quasi-experimental with pre- and posttest control group design was used in this study. Thirty-eight mothers were selected using total sampling in the community feeding center, which control group were chosen by matching the wasting status of their children. Mothers from intervention group were provided with nutrition education, while control group only received regular Posyandu(Pos pelayanan terpadu) programs. Mann-Whitney U test and Wilcoxon Signed Rank test were performed at a 5% level of significance. There was a significant improvement in mothers' knowledge after receiving nutrition education. The difference elevation scores were shown between the intervention (85.25±14.67) and control (72.98±14.67) with p value=0.016; between pre-intervention (59.99+8.60) and post-intervention (85.25±14.67) groups (p<0.001). However, maternal attitudes and practices related to infant and toddler feeding did not affect nutrition education. Maternal knowledge is the only outcome that is significantly affected by nutrition education.

***Keyword**: attitude, children, knowledge, maternal nutrition education, practice*

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh edukasi gizi pada ibu terhadap pengetahuan, sikap, dan praktik pemberian makan pada bayi dan anak di *community feeding center* di Kecamatan Sedayu, Kabupaten Bantul, Yogyakarta. Penelitian *quasi-experimental* ini menggunakan kelompok kontrol *pre-* dan *posttest*. Sebanyak 38 ibu dipilih menggunakan teknik total sampling di *community feeding center* dimana kontrol diambil dengan *matching* status *wasting* anak di posyandu. Ibu pada kelompok intervensi diberikan edukasi gizi sementara kontrol hanya menerima program regular di posyandu. Uji Mann-Whitney U dan Wilcoxon Signed Rank digunakan untuk analisis pada level signifikansi 5%. Terdapat perubahan signifikan pada pengetahuan ibu setelah mendapat edukasi gizi. Perbedaan peningkatan skor pengetahuan ditunjukkan di antara kelompok intervensi (85,25±14,67) dan kelompok kontrol (72,98±14,67) dengan p=0,016, dan di antara pre-intervensi (59,99±8,60) dan post-intervensi (85,25±14,67) dengan p<0,001. Namun, tidak ada perubahan signifikan terkait sikap dan praktik pemberian makan pada bayi dan anak. Pengetahuan ibu merupakan satu-satunya *outcome* yang dipengaruhi oleh intervensi edukasi gizi.

Kata kunci: sikap, anak, pengetahuan, edukasi gizi ibu, perilaku

INTRODUCTION

Maternal and child undernutrition remain a public issue in low- and middle-income countries, including Indonesia (Black *et al.,* 2008). Determinants that are responsible for the elevated rates of maternal and child undernutrition in developing countries included inappropriate infant and young child feeding practices, infectious diseases, poor hygiene and sanitation, food insecurity, and poverty (Ahmed *et al.*, 2012). On the other hand, sufficient nutrition for both mothers and children, especially during the first two years of life, may positively impact the child's growth and development and reduce morbidity and mortality (Kabaran, 2018).

In Indonesia, problems of child nutrition included stunting (30.8%), wasting (10.2%), being underweight (17.7%), and overweight and obesity (8.0%). Poor breastfeeding practices were also presented, such as low coverages of exclusive breastfeeding (37.3%) and breastfeeding initiation (58.2%) (NIHRD, 2019). The proportion of children who met minimum dietary diversity, minimum meal frequency, and minimum acceptable diet were 60%, 72%, and 40%, respectively (National Population and Family Planning Board (BKKBN), 2018). Among mothers, nutritional challenges which may still occur were anemia (37.1%) and chronic energy deficiency (24.2%), although antenatal visit coverage were quite high (81.6% for the first visit and 70.4% for a minimum of four visits) (NIHRD, 2019).

Maternal sociodemographic characteristics may influence the nutritional status of children (Dessie *et al.*, 2019). The relationship between these factors and child nutritional outcome has been well-established through UNICEF framework of malnutrition (UNICEF, 1991). However, mixed results were also shown in several recent studies. Further analysis of Riskesdas 2013 showed no association between maternal education and early initiation of breastfeeding, suggesting that knowledge and access to information might act as an underlying factor (Paramashanti *et al.*, 2016). A similar finding was also revealed among lactating working mothers (Ratnasari *et al.*, 2017).

Nutrition interventions are needed to eliminate the root causes of maternal and child undernutrition. Such interventions could be directed to the investment in maternal aspects such as improving women's literacy and empowerment (Ahmed *et al.*, 2012). Breastfeeding promotion and complementary feeding strategies can benefit child nutrition, however, depending on the settings in which the interventions are conducted. For example, the effects of food supplementation and nutrition education could be different when it came to food secure or food insecure populations and populations with poor or well-established health systems (Bhutta *et al.*, 2013).

Previously, a few experimental studies were conducted in Indonesia to evaluate the effect of maternal nutrition education on child nutrition. However, these studies had a mixed-results and limited by their sample size (Kurniawati & Marfuah, 2017), restricted child's age (Pancarani *et al.*, 2017; Kurniawati and Marfuah, 2017), or only include one of either breastfeeding or complementary feeding (Pancarani *et al.*, 2017; Kurniawati & Marfuah, 2017; Ernawati *et al.*, 2016). Therefore, our study objective was to analyze the effect of nutrition education among mothers on improving knowledge, attitude, and practice of infant and young child feeding.

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MATERIALS AND METHODS

This study used a quasi-experimental design with pretest and posttest control groups conducted in the Community Feeding Center (CFC), Sedayu Subdistrict, Bantul District, Daerah Istimewa Yogyakarta. We did not conduct randomization because there was only one CFC in Sedayu Subdistrict and due to ethical considerations in which CFC already had its subject criteria, we included all children registered in the CFC as our study subjects.

Our study population was a total mother of 38 infants and toddlers. In the intervention group, all infants and young children aged 0-59 months (n= 19), were recorded as participants in the CFC between January and September 2017. The feeding center was located in Argodadi and Argorejo villages and held every week to deliver nutrition programs for malnourished children (e.g., wasted and underweight) such as nutritional anthropometric assessment, nutrition education, and counseling, screening of developmental aspects, and food supplementation. In certain circumstances, home visits were also done for mother-child pairs who missed the CFC schedule. This program was delivered by a nutritionist and midwives from Sedayu II Public Health Center as well as by local lady health workers. Nineteen controls (n= 19) were selected from the neighbour villages under Sedayu I Primary Health Center working area, namely Argosari and Argomulyo villages. The criteria of control were those who were wasted and registered in the *Posyandu (Pos pelayanan terpadu)*. All mothers were asked for informed assent when we recruited their children as our study samples. This study had been ethically approved by the ethical review board of Universitas Alma Ata (KE/AA/VI/617/EC/2017).

The dependent variables in this study were maternal knowledge, attitude, and practice related to breastfeeding, complementary feeding, and family foods whereas the independent variable was nutritional education for mothers. The questionnaire included 15 items on each knowledge, attitude, and practice of breastfeeding, complementary feeding, and family foods. We tested for its validation and reliability prior to the study. Calculation of instrument validity using the person product moment formula and obtained a 90% confidence level, some invalid questions were changed. The reliability test used Alpha Cronbach >6, and it was found that the questionnaire was reliable.

In the intervention group, all mothers were provided with nutritional education by local lady health workers. Previously, lady health workers were trained extensively as described in our previous publication (Paramashanti and Sulistyawati, 2019). The nutritional education for mothers consists of eight sessions of group education and eight sessions of individual counseling. However, in the case of individual nutritional problems, mothers still could access information from the nutritionist or midwives as provided by the regular system of the primary health center. Education materials covered the importance of exclusive breastfeeding, continued breastfeeding, and family foods; timing, adequacy, frequency, and type of complementary foods/family foods; and modified sample menu (PAHO/WHO, 2004; Ditjen Bina Gizi & KIA, 2011). Among the controls group, we did not provide any intervention but let the regular health and nutrition programs provided by the primary health center and *posyandu* worked as the normal system (Health Promotion

Center, 2012).

As the data was not normally distributed, bivariate analysis was performed using the Wilcoxon Signed-Rank test to compare the mean difference between pretest and posttest, and Mann-Whitney U between intervention and control groups. A 5% level of significance was set for all tests. All of the analysis was performed by SPSS version 20.

RESULTS AND DISCUSSION

This study covered the total sample of a community feeding center and all children under the age of five years, with an average age of 33 months, consisted of both breastfeeding and complementary feeding, modified materials based on global and national recommendations, and the involvement of local health workers as the educators. A total of 19 mothers of children under the age of five years were the community feeding center program's target, thus becoming our study participants in the nutrition education intervention while another 19 mothers from neighbor village *posyandu* acted as our study controls. Table 1 presents the characteristics of mothers both in intervention group and in control group. The mean age of mothers were 32.4 years and 31.3 years, respectively, for intervention and control groups. The majority (47.4%) of mothers in the intervention group had senior high school level of education, whereas most of the educational attainment in the control group were junior (42.1%) and senior high school (47.4%).

Table 1. Characteristics of study participants

Characteristics of Mother	Intervention group (n=19)	Control group (n= 19)
Age, y.o (mean±SD)	32.4±5.5	31.3±4.4
Education level (n (%))		
Elementary school	4 (21.1)	2 (10.5)
Junior high school	5 (26.3)	8 (42.1)
Senior high school	9 (47.4)	9 (47.4)
Higher degree	1 (5.3)	0 (0)
Working status (n (%))		
Not working	16 (84.2)	16 (84.2)
Working	3 (15.8)	3 (15.8)

We compared the changes in knowledge, attitude, and practice related to infant and toddler feeding between intervention and control group, and between pre- and post-intervention phases. Based on Table 2, there was a difference in the knowledge scores between intervention and control groups after the nutrition education was given (p-value of 0.016). The knowledge score in the intervention group was 85.25±14.67, whereas the knowledge score in the control group was 72.98±14.67. In the Table 3, the knowledge score also changed before and after the nutrition education was given to the intervention group ($p<0.001$). Before being provided with the nutrition education, the knowledge score was 59.99±8.60, while after getting the nutrition education, the knowledge score was 85.25±14.67. This finding was in line with other studies conducted in China (Liu *et al*., 2009). Southern Ethiopia (Mulualem

et al., 2016), and Kenya (Mbogori & Murimi, 2019). The nutrition education conducted every week might improve knowledge of selected nutrition topics due to repeated messages. Such intervention enabled participants to discuss and consult issues related to child feeding practices as well as health problems with the educators (Inayati *et al.*, 2012). This two-way direction of nutrition education which is conducted regularly, may benefit mothers to absorb the information given to them.

Table 2. The differences of maternal knowledge, attitude, and practice related to infant and toddler feeding between intervention and controls

Outcomes	Intervention group* (n=19)	Control group (n=19)*	P-value**
Knowledge			
Pre-intervention	59.99±8.60	62.11±16.64	0.645
Post-intervention	85.25±14.67	72.98±14.67	0.016
Attitude			
Pre-intervention	60.35±10.06	61.05±10.25	0.805
Post-intervention	63.86±9.50	62.09±11.97	0.558
Practice			
Pre-intervention	76.14±10.74	61.05±13.56	0.003
Post-intervention	82.09±15.72	48.77±8.02	<0.001

***: Mean±SD, **:α=0.05**

Table 3. The differences of maternal knowledge, attitude, and practice related to infant and toddler feeding pre-test and post-test

Outcomes	Pre-test(n=19)*	Post-test (n=19)*	p-value**
Intervention group			
Knowledge	59.99±8.60	85.25±14.67	<0.001
Attitude	60.35±10.06	63.86±9.50	0.235
Practice	76.14±10.74	82.09±15.72	0.183
Control group			
Knowledge	62.11±16.64	72.98±14.67	0.066
Attitude	61.05±10.25	62.09±11.97	0.776
Practice	61.05±13.56	48.77±8.02	0.010

***: Mean±SD, **:α=0.05**

There was a slight difference in the attitude scores between intervention (63.86±9.50) and controls (62.09±11.97) after the nutrition education was provided, however, the result was not significant (p=0.558) (see Table 2). In addition, Table 3 also presents a slight difference in the attitude scores before (60.35±10.06) and after intervention (63.86±9.50). Nonetheless, the difference between pre- and post-

intervention was also not significant (0.235). There was no effect of maternal education on the maternal attitude towards infant and young child feeding. Earlier studies showed that maternal attitude related to child dietary intake was influenced by maternal prior educational level (Al-Shookri *et al*., 2011; Oli *et al*., 2018). Mothers with adequate nutrition-related knowledge did not always result in the expected attitude (Chien *et al*., 2018). A study among Chilean children revealed that a previous intervention which was conducted for two years could increase the positive attitude of mothers regarding their child nutrition (Mulder *et al*., 2009). Different from knowledge as an outcome, attitude could be improved when the nutrition education intervention is done in a longer period of time (e.g., months or even years).

Table 2 provides a significant difference in the nutrition-related practice scores between the intervention (82.09$\pm$15.72) and control (48.77$\pm$8.02) groups with a p-value of <0.001. However, our study participants already had different scores before the intervention was given in which intervention group already had a higher practice score (p=0.003). Meanwhile, if we look at the Table 3, there was a difference in the practice scores between pre- and post-intervention, but also not significant (p=0.183). Before the intervention was given, our study groups were already differed by their nutrition practice. The possible explanation is because of the effect of the existing program within the community feeding center. Moreover, there was no difference between pre- and posttest results among the intervention group. Therefore, we can conclude that there was no effect of maternal nutrition education on nutrition practice regarding infant and toddler feeding. Beletew *et al.* (2019) stated that a good nutrition practice was predicted by adequate levels of knowledge and attitude, parental formal education, family income, and postnatal care utility. When mothers did not possess a positive attitude toward infant and toddler feeding, The practice of child feeding could not be met (Chien *et al*., 2018). Thus, by having sufficient knowledge and attitude, mothers' influences on child feeding could not be simply achieved if mothers could not act as the gatekeepers of social factors which might affect a child's diet such as access to media, modeling, and cultural and familial beliefs (Savage *et al*., 2007). Therefore, we suggest that the following nutritional education intervention should consider the duration of intervention given to improve the knowledge and attitude, thus meeting the dietary practices as recommended. Providing information on infant and young child feeding is highly important. However, empowering mothers with adequate decision-making and problem-solving strategies related to child nutrition is also crucial in order to provide high-quality diet to their infants and children.

This study involved local lady health workers which enable the mothers to get engaged with the educators easily as they also participated in the regular programs within the feeding center. Thus, the nutrition messages might be delivered effectively. This study also empowered local lady health workers with recent information on infant and young child feeding as well as education and counseling skills so that after this study ended, they would be able to use them for delivering nutritional programs in the feeding center.

Our finding could be limited by the timeframe of the intervention which was 8 sessions in an approximately one-month period. This factor may explain the effect of maternal nutrition education which only significantly improved maternal

knowledge but not attitude and practice. If we compared to Cullen *et al.* (2001) regarding changes in dietary behavior, our study participants may still be in the first stage of the goal-setting process which is "recognition of problem" or in other words, mothers were still recognizing the issues related to their infant and young feeding. For that reason, mothers had not yet changed their attitude and practice.

CONCLUSION

There was a significant effect of maternal nutritional education on the improvement of maternal knowledge regarding infant and young child feeding. Nonetheless, no significant effect was shown on maternal attitude and practice in child nutrition. Findings from this study suggest that nutritional education for mothers is a crucial key to improve maternal knowledge. Such intervention should be provided as a long-term investment (e.g. since the preconception period or early pregnancy) so that the effects on maternal nutritional attitude and practice could be achieved. Thus, improving child nutritional status.

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