

International Journal of Advancement in Life Sciences Research Online ISSN: 2581-4877 Journal homepage http://ijalsr.org



Original Article

Effectiveness of Nutritional Health Interventions on Improving Knowledge, Attitude, and Eating Habits among Malnourished Toddlers

Yani Maidelwita^{*}, Tukimin bin Sansuwito, Faridah Binti Mohd Said, Sandeep Poddar

Lincoln University College, Wisma Lincoln, 12-18, Jalan SS 6/12, 47301 Petaling Jaya, Selangor D. E, Malaysia

*Correspondence E-mail: <u>maidelwitayani@gmail.com</u>

Abstract

Objective: Malnutrition in children under five years old has been a public health problem for a long time. More than a third of all child deaths occur as a result of malnutrition. This study aims to determine the effectiveness of nutritional health interventions in improving knowledge, attitudes, and eating habits in malnourished children. Methods: A quasi- experimental design was adopted in this investigation. The size of the sample was 140. Participants were assigned in a random order of 1:1 (70 intervention and 70 control groups) in the area of the Seberang Padang Health Center. The intervention's effect was calculated using a difference in difference (DID) analysis. Results: The baseline findings revealed significant differences in sociodemographic (mother's age p=0.006;socioeconomic p=0.007; education p=0.002; occupational p=0.011) and children's socio demographics (age: p=0.016; sex: p=0.042; birth weight: p=0.049; exclusive breastfeeding: p=0.001, immunisation status: p=0.001, infectious disease: p=0.001, vitamin A, attitude, and eating habits differed, indicating a significant increase in score from the baseline to the end line (knowledge: DID = 6.114, 95% CI = 5.556-6.673, p=0.001; attitude: DID =18.643, 95% CI = 17.043-20.242, p= 0.001; and eating habits: DID = 7.586, 95% CI = 6.556-8.615, *p* =0.001). **Conclusion**: The nutritional health intervention carried out for six months produced significant evidence of improved knowledge, attitudes, and eating habits in malnourished children. Policy planning and implications in Padang City, West Sumatera still need more focus on research that addresses child nutrition habit, as there is no research done in this area.

Keywords: - eating habits, knowledge & attitude, malnutrition, nutritional health intervention, sociodemographic

Introduction

Malnutrition is a leading cause of death and disability in children under the age of five worldwide (Tette *et al.*, 2016). Nearly a third of all child deaths occur as a result of malnutrition. Based on biochemical, clinical, and anthropometric assessments (measurements of height, weight, and proportions of the human body). Malnutrition can be grouped into mild malnutrition, moderate malnutrition, or severe malnutrition (Tette *et al.*, 2016).

Malnutrition is the medical term for "undernutrition," and it encompasses both undernutrition and overnutrition. The World Food Program (WFP) defines malnutrition as a condition in which an individual's physical performance is damaged to the point where they are unable to sustain adequate bodily processes such as pregnancy, lactation, growth, physical activity, and illness resistance and recovery (Bain *et al.*, 2013).

Malnutrition in children is a severe health issue that affects underdeveloped countries. Malnutrition has significant health effects on childhood and adult development. Malnutrition in children can cause disorders and affect cognitive capacity in the long-term that contribute to reducing labor productivity in adulthood (Habyarimana, 2016). Malnutrition affects children under the age of five due to a range of factors, the most common of which are insufficient food intake, severe and repeated diseases, or a combination of the two. Low parental education, poverty, poor sanitation, diarrhea and other diseases, low food intake, family size, poor feeding practices, short birth spacing, availability of mother's time, child parenting techniques, and seasons are all common causes of malnutrition. Other causes of malnutrition are socio-economic and cultural causes of malnutrition, which indicate a close relationship with the incidence of malnutrition (Abera, Dejene & Laelago, 2017). The determinant factors found were significant immunisation status, and а history of breastfeeding associated with poor nutrition (Maidelwita, 2019).

In 2017, malnutrition affected 3.8% of toddlers (0-23 months) and 14.0% of toddlers in Indonesia. The proportion of malnourished children under the age of five was higher (17.8%) than the proportion of malnourished toddlers (14.8%). Malnutrition is prevalent among 17.5% of the population of West Sumatera, one of Indonesia's provinces (Maidelwita, 2019).

The coverage of underweight (weight for age) in Padang City in 2019 was 2,980 cases (6.7%) of children under five years of age, compared to the target of 44,296 people in the previous year (1.0%). The coverage of stunting (low height for age) was 4,266 cases (9.6%) of 44,296 children under five years ago, the results of this screening also increased from 2018 Health Profile 2019 48 (7.6%) and wasting (low weight for height) of 1,947 cases (4.4%) of 44,296 people, and also a lot increased from 2018 (0.5%). The highest case of malnutrition in the city of Padang is at the Seberang Padang Public Health Center. 9.7% coverage of wasting (weight for height), 15.5% coverage of underweight (weight for age), and 20.6% coverage of stunting (height for age) (Padang City Health Office, 2019).

Addressing health and nutrition problems at the family level needs community involvement. From various studies in Indonesia, it was found that health and nutrition problems tended to be considered individual family problems, so the community's concern for overcoming health and nutrition problems was still low (Health Department, Republic of Indonesia, 2007). The nutritional health intervention program is a program in which family members carry out balanced nutrition, can recognise the health and nutritional problems of each family member, and can take steps to overcome nutritional problems faced by family members (Gunanti, Devi & Adriani, 2005).

A nutritional health intervention is an action carried out for, with, or on behalf of a person or population to assess, enhance, maintain, promote, or modify health, function, or health status.

Nutritional health interventions should span a wide variety of health and nutrition-related activities. Not only for effectiveness but also organisational efficiency, they must be diverse. The mechanisms necessary for community-based initiatives will never make sense or be sustainable for a single intervention. The reason for this research is focused on nutritional health interventions based on a recommendation from the Health Department of the Republic of Indonesia (2007), which states that further research is needed on the effectiveness of nutritional health interventions in improving knowledge, attitude, and eating habits in malnourished children under five years of age.

Material and Methods

A quasi-experimental approach was adopted in the research, with a pre-test and post-test control group. Repeated household surveys were done at control and intervention areas in August 2020 for the baseline stage, and in February 2021 for the end line stage.

Data Collection

The methods used for data collection include observation, questionnaires, interviews, physical experiments, and multi-methods and nutritional health interventions (Sekaran & Bougie, 2016). The questionnaire was self-administered to identify practices that influence the incidence of malnutrition.

The structured questionnaire contains open and closed questions that are arranged according to the variables studied. Questionnaire were modified and tested for validity and reliability prior to implementation to ensure the questionnaire was almost the same characteristics as the location under study. To find out if the language is understandable enough by enumerators and respondents.

Sample size and Data analysis

The study has been conducted among 140 respondents (intervention and control group) Seberang Padang Health Center's working area in Padang City, West Sumatra Province. The Statistical analysis was performed using the t-test and chi-square by G. Power analysis software Version 3.1.9.7. The difference in difference (DID) analysis was used to estimate the effect of the interventions. The examination of differences in differences is predicated on the assumption that the intervention's outcomes have no underlying time-dependent trend.

Intervention

Nutritional health intervention integrated community base nutritional interventions aimed at Growth Monitoring and Health Education. Nutritional assessment interventions are carried out based on nutritional health interventions to increase the practice of supplementary feeding. It is thought that when mothers obtain an understanding of child nutrition management and nutrition education, their children will eat better. Internalised, this will result in behavioural modifications and a reduction in malnourished children. Nutrition assessment conducting positive deviance hearth program, micronutrient supplementation, supplementary food, and Vitamin A supplementation. Growth monitoring consists of measurement (routine recording of children's weight and sometimes their height); assessment (planning weight for age or weight for height on a growth chart; analysis (interpreting a child's growth pattern); and actions related to analysis (e.g., nutrition education, emotional demonstration, counseling, administering nutritional supplements or examining a child for disease).

Comparison Group

Nutrition assessments, nutrition instruction, or home visits by researchers, public health workers, or cadres were not provided to the comparison group. Participants in the comparison group received a collection of printed teaching materials as well as nutritional supplementation benefits from the government. All mothers in the study were given the standard care of monthly growth monitoring of their child's nutritional condition at the "*POSYANDU*" (*Integrated Child Health care Center in Indonesia*), as well as access to the Indonesian government's supplemental food program. For children under the age of five, a supplementary feeding program is supplied, consisting of food with a total energy of 1000 to 1550 kcal and protein of 25-39 g.

Ethical approval

Ethical approval has been obtained from the institutional ethical committee, Padang City Health Office 5/57/SDMK & Jamkes/2019, and the Seberang Padang District 200.13/CPS-Kessos/2019. Informed consent was obtained from the mothers before assessed their data in the study.

Results

The Socio-Demographic Characteristics of mother

Socio-demographic characteristics of the mother at baseline are summarised in Table 1. The intervention and control group respondents had substantial variations in age, socio-economic status, education, and occupation when it came to malnutrition.

The intervention group for mothers with children under five at the age of fewer than 20 years was 8.6%, followed by the age group 20-35 with 68.6% and more than 35 in the age group of 22.8%. A maximum of 48.6% of women had a poor socioeconomic status, 47.1% had middle socioeconomic and 4.3% had rich socioeconomic at the intervention group. Most of the intervention participants were educated i.e 88.6%. where 4.3% and 8.6 % had completed tertiary school and senior

secondary education respectively. 51.4% had primary education where 24.3 % were qualified with junior secondary education and 11.4% of mothers were illiterate. A maximum of 84.3% of mothers in the intervention group did not work and 15.7% worked. The data analysis results showed that the mother's age, socioeconomic, education, and occupational malnutrition of the respondent's intervention and the control group had a significant relationship with health intervention (mother's age: p=0.006, socio-economic: p=0.007, education: p=0.002, occupation: p=0.011)

Socio-demographic characteristic	Intervention		Control		<i>p</i> -value
of mother	n	%	n	%	•
Mother's Age					
Less than 20	6	8.6	3	4.3	0.006*
20-35	48	68.6	63	90	
More than 35	16	22.8	4	5.7	
Socio-economic					
Poor	34	48.6	52	74.2	0.007*
Midlle	33	47.1	16	22.9	
Rich	3	4.3	2	2.9	
Mother's education					
Illiterate	8	11.4	5	7.1	0.002*
Primary School	36	51.4	19	27.1	
Junior secondary school	17	24.3	17	24.3	
Senior secondary school	6	8.6	20	28.6	
Tertiary school	3	4.3	9	12.9	
Mother's Occupation					
Non-working	59	84.3	45	64.3	0.011*
Working	11	15.7	25	35.7	

Table 1. Socio-demographic characteristics of mother in the intervention and control group

Significant = *p*-value<0.05* (therefore, if significant is indicated by*)

Socio-Demographic Characteristics of Children

Table 2 shows the socio-demographic characteristic of children at the baseline of the study.

 Table 2. The socio-demographic characteristics of Children under Five years ago

Socio-Demographic	Intervention		Contro	Control	
Characteristic of Children	n	%	n	%	-
Age (Month)					
2-23	24	34.3	10	14.3	0.016*
24-35	20	28.6	17	24.3	
36-47	23	32.9	37	52.9	
48-59	3	4.3	6	8.6	
Sex					
Male	42	60	30	42.9	0.042*
Female	28	40	40	57.1	
Birth Weight					
Less Than 2500 gram	8	11.4	2	2.9	0.049*
Normal	62	88.6	68	97.1	
Exclusive Brestfeeding					
No	51	71.8	19	27.5	<0.001*
Yes	20	28.2	50	72.5	
Immunization Status					
Incomplete	36	51.4	57	81.4	<0.001*
Complete	34	48.6	13	18.6	
Infectious diseases					
Have Infectious diseases	51	72.9	28	40	<0.001*
Not have Infectious diseases	19	27.1	42	60	
Vitamin A Status					
Not up to date	61	87.1	25	35.7	<0.001*
Up to date	9	12.9	45	64.3	

Significant = *p*-value<0.05* (therefore, if significant is indicated by*)

The table 2 displays that children's age in the intervention group was 34.3% aged ranged 12-23 month, 28.6% aged ranged 24-35 month, 32.9% aged ranged 36-47 month, and 4.3% aged ranged 48-59 month. More than half 60% were male and 40% female. In the group receiving Intervention 88.6% of children were born normal with a birth weight of equal to or more than 2500 gr and 11.4% with a low birth weight i.e less than 2500 gr. 78.6% were exclusive breastfeeding and 21.4% were not exclusive breastfeeding. 48.6% of children were fully immunised and 51.4% were not immunised completely. The result of this study shows that more than half (72.9%) of children did not have a disease history and 27.1% had Infectious diseases. 87.1% of intervention children are not up to date getting vitamin A and 12.9% are up to date to get vitamin A.

Age, sex, birth weight, exclusive breastfeeding, immunisation status, infectious disease, and vitamin A supplementation were all significantly different between the intervention and control groups (age: p=0.016, sex: p=0.042, birth weight: p=0.049, exclusive breastfeeding: p<0.001, immunisation status: p<0.001, infectious disease: p<0.001, vitamin A supplementation: p<0.001).

Knowledge, Attitude, and Eating habit on Baseline

To assess differences in knowledge, attitude, and eating habits of children under five before being given nutritional health intervention calculated from the results of the baseline. The following can be seen in the distribution table 3:

Variable	Intervention Mean ±SD (n=70)	Control Mean ±SD (n=70)	Overall sample Mean ±SD (n=70)	Minimum Maximum	- t	<i>p</i> -value
Knowledge	10.56 ± 0.927	10.79 ± 1.034	10.67 ± 0.985	9 - 14	- 1.377	0.171
Attitude Eating habit	61.91 ± 3.904 57.27 ± 3.310	62.17 ± 3.226 59.39 ± 2.886	62.04 ± 3.570 58.33 ± 3.271	52 – 70 50 – 67	- 0.425 - 4.028	0.672 <0.001*

 Table 3. Mean Value for Knowledge, Attitude, and Eating habits on Baseline

t=independent *t*-test Significant= p<0. 05* (therefore, if significant indicate with*)

At baseline, the mean \pm SD for knowledge scores in the intervention and control groups was 10.67 \pm 0.99, according to Table 3. The grades ranged from 9 to 14, with 9 being the lowest and 14 being the highest. The mean \pm SD for attitude ratings in the intervention and control groups at the baseline of the trial was 62.04 \pm 3.57. The results varied from 52 to 70 points. At baseline, the mean \pm SD for eating behaviors scores in the intervention and control groups was 58.33 \pm 3.27. The range of scores is 50 to 67. At baseline, there were no statistically significant differences in knowledge or attitudes between the intervention and control groups (p = 0.171 and p = 0.672, respectively). However, there was a statistically significant difference between the intervention and control groups in terms of eating behaviors (p<0.001).

Knowledge, Attitude, and Eating habits on End Line

To determine variations in knowledge, attitude, and eating habits of children under the age of five before a nutritional health intervention based on the end line findings. The distribution table 4 shows the following:

Variable	Intervention Mean ±SD (n=70)	Control Mean ±SD (n=70)	Overall sample Mean ±SD (n=70)	Minimu m - Maximu m	t	<i>p</i> -value
Knowledge	16.67 ± 1.847	10.79 ± 1.062	13.73 ± 3.313	9 - 23	23.112	<0.001*
Attitude	80.40 ± 6.215	62.01 ± 2.678	71.21 ± 10.385	54 – 90	22.731	<0.001*
Eating habit	65.19 ± 3.961	59.71 ± 2.860	62.45 ± 4.403	50 – 72	9.370	<0.001*

Table 4. Mean Value for Knowledge, Attitude, and Eating habits on End Line

t=independent *t*-test Significant= $p < 0.05^*$ (therefore, if significant indicate with*)

At the end of the study, the mean ±SD for knowledge between the intervention and control groups

was 13.73±3.31 with scores ranging from 9 to 23, and the mean ±SD for attitude was 71.21±10.38 with scores ranging from 54 to 90. The mean ±SD for eating habits was 62.45±4.40, with a range of 50 to 72. There were statistically significant differences in knowledge, attitudes, and eating habits between the intervention and control groups at the end line (p<0.001, p<0.001, p<0.001, respectively).

The Effectiveness of Nutritional Health Intervention on improving Knowledge, Attitudes, and Eating habits in Malnourished Children under Five Years Old

To determine variations in knowledge and malnutrition among children under the age of five after receiving a nutritional health intervention following that:

Table 5.Comparison of Knowledge, Attitude and eating Habits of Malnutrition between Groups usingNutritional Health Intervention

	Intervention			Control		
	Baseline	End line	Baseline	End line		
Variable	Mean ±SD (n=70)	Mean ±SD * (n=70)	Mean ±SD (n=70)	Mean ±SD (n=70)	DID * Mean(95%CI)	
Knowledge	10.56±0.93	16.67±1.85	10.79±1.03	10.79±1.06	6.11 (5.56-6.67)	
Attitude	61.91± 3.90	80.40± 6.22	62.17±3.23	62.01±2.68	18.64(17.04-20.24)	
Eating Habits	52.27±3.31	65.19± 3.96	59.39±2.89	59.71± 2.86	7.59 (6.56-8.62)	

* Significant < 0.001

Table 5 reveals that knowledge in the intervention group had a statistically significant difference between the baseline and end line of the study (p<0.001) while knowledge in the control group did not have a significant difference between the baseline and end line of the study (p=1.000). The knowledge variables differed, indicating a significant increase in score from the baseline to the end line of the study (DID: 6.114, 95 % CI: 5.556-6.673, p<0.001). There was a statistically significant difference in attitude between the intervention at the baseline and end line of the study (p<0.001), but not in the control group, there was no statistically significant difference between the baseline and end line of the study (p<0.001). The attitude factors differed, indicating that the score increased significantly from the baseline to the end line of the trial (DID=18.643, 95 % CI=17.043-20.242, p<0.001). Eating habits were statistically significant in the intervention group (p<0.001) at the baseline and end line of the study, whereas eating habits in the control group were not statistically significant (p=0.279). Eating habit variables showed a difference which means the results indicate a significant increase in the score from the baseline to the end line of the study, namely in the intervention group (DID=7.586, 95%CI=6.556-8.615, p<0.001).

Discussion

The goal of this research was to evaluate if a 6-month nutritional health intervention program might improve children's nutrition knowledge, attitudes, and eating habits. The baseline and end-line treatments were shown to have a statistically significant difference (p<0.001) in this research. After the nutritional health intervention, there was an improvement in participants' comprehension of malnutrition as compared to baseline data.

The current study's findings on the efficacy of nutritional health interventions are supported by the findings of the Triple Benefit Health Education Intervention on Knowledge in Borno State, Nigeria (Shapu *et al.*, 2022).

According to Shaaban *et al.* (2014), educational interventions on malnutrition can enhance knowledge about nutrition-related concerns, which is an important aspect of developing positive attitudes and practices, which contribute to higher diet quality. Because through this educational activity, knowledge increased significantly.

Nutritional status was enhanced as a result of mothers' greater understanding and practice of food diversity as a result of nutrition education, as demonstrated in this study (Kajjura, Veldman & Kassier, 2019).

A mother's knowledge about balanced nutrition is very important to improve family health, which affects nutritional status and welfare. Their KAP (Knowledge, Attitude, and Practice) regarding

balanced nutrition and a healthy lifestyle is critical for supporting their adequate nutritional status and health. Mothers who are well-versed in their subject matter are expected to practice well. Knowledge is the construction of beliefs, information, and skills that are provided both through experience and education (Prasetya, & Khomsan, 2021).

In terms of nutrition and eating, the ability to remember specific information related to the benefits of food and nutrition is considered knowledge. While eating attitudes are recognised as the behaviour of individuals who have knowledge or are not following their emotional, motivational, perceptual, and cognitive beliefs (Marías & Glasauer, 2014). Attitudes towards food and nutrition may include positive or negative dispositions of individual health concerns, dietary practices, nutrition recommendations, dietary guidelines, or dietary preferences. Children's eating behavior can be determined by healthy eating attitudes based on family influences, experiences, knowledge, and norms (Kostanjevec, Jerman & Koch, 2012).

Similarly, findings from a study in Bekaa, Lebanon, demonstrate that this school-based nutrition intervention had a positive influence on attitudes and nutrition (El Harake, 2018). Interventions in nutrition education, on the other hand, have the potential to improve maternal attitudes. The same data showed that educational intervention studies in Canada, Palestine, Shahr-e-Kord city, Iran, Bangladesh, and China had big changes after the intervention and after follow-ups. But, in Urbana and Bangalore, there were no meaningful changes after the intervention (Shapu *et al.,* 2022).

Nutritional health interventions are proven to improve the attitudes of mothers and toddlers towards preventing malnutrition. Nutritional health treatments use a long-term strategy to ensure children's nutritional well-being. Although the participants came from a variety of socioeconomic backgrounds, the nutritional health intervention was beneficial in developing their attitudes by providing relevant information as a practical solution to boosting their positive attitudes toward life (Costa & Oliveira 2023; Spinelli *et al.* 2023).

This result follows previous research, which reported that nutrition is one of the positive outcomes or impacts of health interventions. It is a change in the affective domain that raises awareness and positive attitudes. The correlation with this research is that the intervention given can significantly increase awareness and produce positive attitudes towards a better way (Jumiyati & Yulianti, 2016).

Attitudes are emotional, motivational, perceptual, and cognitive beliefs that influence a person's conduct or practice positively or negatively. Regardless of the individual's knowledge, attitudes influence future behaviour and can help explain why someone chooses one practice over another. Attitudes, beliefs, and perceptions are all phrases that have the same meaning (Marías & Glasauer, 2014).

The results show that the control groups do not have statistically significant differences in eating habits between baseline and end line. After the health intervention, there was also a statistically significant difference between baseline and end-line (p<0.001) post-intervention. The content and the methodological idea had a positive impact on children's eating habits.

Similarly, the findings of the study in Enugu State's North Enugu agricultural zone point to the need for community-based nutrition counseling interventions that will dramatically enhance children's eating habits and well-being. Promoters of health, families, nutritionists, counselors, child educators, school employees, rural extension workers, and children themselves must all collaborate on ongoing initiatives. An examination of the long-term potential of community-based nutrition counseling treatments on children's future nutrition is once again required (Dike *et al.*, 2021; Melo *et al.* 2020).

Following a nutritional health intervention on eating habits, there was a significant increase in the mean score. Based on the results of the study, the eating habits of children who have nutritional problems are bad. Children eat food sources irregularly; they only eat them a few times, which is the cause of this. Additionally, mothers only give their children food sources they know they will like and don't supplement their diet with other foods. Picky eaters and food skippers, for example, may be at risk for behavioural disorders as well as difficulties with growth and development (Lodhi *et al.*, 2010; Sahiledengle *et al.* 2022; Yazew *et al.* 2022). Most children in Padang have poor eating habits; however, nutritional health interventions can help improve eating habits. Poor eating habits and a lack of nutritional awareness harm health and raise healthcare expenses, particularly in rural areas. Community development programs can work with nutritional health interventions such as nutrition interventions, health education, and professional counselling to build a dietary framework to support rural households, which are largely farmers, in developing eating habits in Padang City. According to Dike *et al.* (2021), nutrition counselling can help rural households become acclimated to one of the

most basic elements of good health: a balanced diet. Nutritional health interventions, on the other hand, can help change eating habits.

Conclusion

Nutritional health intervention improved malnourished children's knowledge, attitudes, and eating habits, according to this study. Early diagnosis of individuals at risk of malnutrition and fast nutritional intervention are required to successfully manage the nutritional status of children most at risk and hence promote favourable clinical outcomes. The importance of nutritionists' role in providing dietary advice and support should not be overlooked. To reduce the number of malnourished children, strategies are used that are based on good nutritional assessment and good nutrition.

Acknowledgement

The authors are thankful to the institutional management for academic support.

Conflict of Interest:

The authors declare no conflict of interest.

References

Abera, L., Dejene, T., & Laelago, T. (2017). Prevalence of malnutrition and associated factors in children aged 6–59 months among rural dwellers of damot gale district, south Ethiopia: community based cross sectional study. *International Journal for Equity in Health*, *16*, 1-8. <u>https://doi.org/10.1186/s12939-017-0608-9</u>

Bain, L. E., Awah, P. K., Geraldine, N., Kindong, N. P., Sigal, Y., Bernard, N., & Tanjeko, A. T. (2013). Malnutrition in sub-Saharan Africa: Burden, causes and prospects. *Pan African Medical Journal*, 15. <u>https://doi.org/10.11604/pamj.2013.15.120.2535</u>

Costa, A., & Oliveira, A. (2023). Parental Feeding Practices and Children's Eating Behaviours: An Overview of Their Complex Relationship. *Healthcare (Basel, Switzerland), 11*(3), 400. https://doi.org/10.3390/healthcare11030400

Dike, I. C., Ebizie, E. N., Chukwuone, C. A., Ejiofor, N. J., Anowai, C. C., Ogbonnaya, E. K., ... & Chikwendu, J. N. (2021). Effect of community-based nutritional counseling intervention on children's eating habits. *Medicine*, *100*(30). <u>https://doi.org/10.1097/MD.00000000026563</u>

El Harake, M. D., Kharroubi, S., Hamadeh, S. K., & Jomaa, L. (2018). Impact of a pilot school-based nutrition intervention on dietary knowledge, attitudes, behavior and nutritional status of syrian refugee children in the Bekaa, Lebanon. *Nutrients*, *10*(7), 913. <u>https://doi.org/10.3390/nu10070913</u>

Gunanti, I. R., Devi, S. R., & Adriani, M. (2005). Pemberdayaan kader posyandu melalui penerapan metode konseling gizi dalam upaya meningkatkan kualitas pembinaan program keluarga sadar gizi (KADARZI). *Buletin Penelitian Sistem Kesehatan, 8*(1), 21117. <u>https://media.neliti.com/media/publications-test/21117-pemberdayaan-kader-posyandu-melalui-pene-6a86b331.pdf</u>

Habyarimana, F. (2016). Key determinants of malnutrition of children under five years of age in Rwanda: Simultaneous measurement of three anthropometric indices. *African Population Studies*, *30*(2).<u>https://doi.org/10.11564/30-2-836</u>

Health Department Republic of Indonesia. (2007). Guidance on KIE nutrition awareness family strategi. 1–45. https://onesearch.id/Record/IOS9.123456789-4503

Jumiyati, J., & Yulianti, R. (2016). Nutrition education improves mother's knowledge and attitude in the provision of complementary foods. 316–321. <u>https://publikasiilmiah.ums.ac.id/bitstream/handle/11617/7417/38%20-%20Jumiyati.pdf?sequence=1&isAllowed=y</u>

Kajjura, R. B., Veldman, F. J., & Kassier, S. M. (2019). Effect of nutrition education on knowledge, complementary feeding, and hygiene practices of mothers with moderate acutely malnourished children in Uganda. *Food and Nutrition Bulletin*, 40(2), 221-230. <u>https://doi.org/10.1177/0379572119840214</u>

Kostanjevec, S., Jerman, J., & Koch, V. (2012). The Influence of Nutrition Education on the Food Consumption and Nutrition Attitude of Schoolchildren in Slovenia. *Online Submission*. <u>https://files.eric.ed.gov/fulltext/ED538831.pdf</u>

Lodhi, H. S., Lodhi, F. S., Wazir, S., & Jadoon, H. (2010). Assessment of nutritional status of 1–5 year old children in an urban union council of Abbottabad. *Journal of Ayub Medical College Abbottabad*, 22(3), 124-127. <u>https://pubmed.ncbi.nlm.nih.gov/22338436/</u>

Maidelwita, Y. (2019). Risk Factors for Malnutrition of Children Under Five Years Old on the Area of Nanggalo Public Health Center Padang West Sumatera. *Malaysian Journal of Medical Research (MJMR)*, *3*(1), 10-17. <u>https://doi.org/10.31674/mjmr. 2019. v03i01.003</u>

Marías, Y. F., & Glasauer, P. (2014). *Guidelines for Assessing Nutrition-Related Knowledge, Attitudes and Practices.* Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/publications/card/en/c/e1dfc1bb-0951-5221-a333-961243626fb6/

Melo, P., Sousa, M. I., Dimande, M. M., Taboada, S., Nogueira, M. A., Pinto, C., Figueiredo, M. H., Nguyen, T. H., & Martínez-Riera, J. R. (2020). Descriptive Study of Children's Nutritional Status and Identification of Community-Level Nursing Diagnoses in a School Community in Africa. International journal of environmental research and public health, 17(17), 6108. <u>https://doi.org/10.3390/ijerph17176108</u>

Padang City Health Office. (16th March 2019). Profil Kesehatan Tahun 2019. https://dinkes.padang.go.id/profil-kesehatan-tahun-2019

Prasetya, G., & Khomsan, A. (2021). The Knowledge, Attitude and Practice of Mothers and Children on the Indonesian Dietary Guidelines and the Relationship with Children's Nutritional Status. *J Gizi Dan Pangan*, *16*(1), 55-64. <u>http://journal.ipb.ac.id/index.php/jgizipangan</u>

Sahiledengle, B., Mwanri, L., Petrucka, P., Kumie, A., Beressa, G., Atlaw, D., Tekalegn, Y., Zenbaba, D., Desta, F., Teferu, Z., Wordofa, D., Seyoum, K., Gomora, D., Negash, G., & Agho, K. E. (2022). Determinants of undernutrition among young children in Ethiopia. *Scientific reports*, *12*(1), 20945. <u>https://doi.org/10.1038/s41598-022-25160-y</u>

Sekaran, U., & Bougie, R. (2016). Research methods for business: A skill building approach. john wiley & sons.

Shaaban, S. Y., Nassar, M. F., Shatla, R. H., Deifallah, S. M., Marzouk, D., & Abogabal, W. I. (2014). Nutritional knowledge, attitude and practice of predominantly female preschool teachers: effect of educational intervention. *British Journal of Medicine and Medical Research*, *4*(8), 1739-1749. https://doi.org/10.9734/bjmmr/2014/6872

Shapu, R. C., Ismail, S., Lim, P. Y., Ahmad, N., Garba, H., & Njodi, I. A. (2022). Effectiveness of Triple Benefit Health Education Intervention on Knowledge, Attitude and Food Security towards Malnutrition among Adolescent Girls in Borno State, Nigeria. *Foods*, *11*(1), 130. <u>https://doi.org/10.3390/foods11010130</u>

Spinelli, A., Censi, L., Mandolini, D., Ciardullo, S., Salvatore, M. A., Mazzarella, G., Nardone, P., & 2019 OKkio alla SALUTE Group (2023). Inequalities in Childhood Nutrition, Physical Activity, Sedentary Behaviour and Obesity in Italy. Nutrients, 15(18), 3893. https://doi.org/10.3390/nu15183893

Tette, E. M., Sifah, E. K., Nartey, E. T., Nuro-Ameyaw, P., Tete-Donkor, P., & Biritwum, R. B. (2016). Maternal profiles and social determinants of malnutrition and the MDGs: What have we learnt? *BMC Public Health*, *16*(1). https://doi.org/10.1186/s12889-016-2853-z

Yazew, T., & Daba, A. (2022). Associated Factors of Wasting among Infants and Young Children (IYC) in Kuyu District, Northern Oromia, Ethiopia. *BioMed research international*, 2022, 9170322. https://doi.org/10.1155/2022/9170322