Complementary feeding based on local-food to improve mother ability in fulfillment nutrition stunted children

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ABSTRACT

Introduction: Mothers have the ability to provide adequate nutrition for their children. The role of providing nutrition to children aged 6-24 months who are stunted correlated to the mother's ability to provide proper nutrition. The role of mother can be carried out using the ability, confidence, and self-capacity to complete tasks, managing and providing nutrition to children aged 6-24 months who are stunted. This study aimed to analyze complementary feeding based on local food to improve the mothers' ability to fulfill their needs in stunted children.

Materials and Methods: A pre-experiment design was used to obtain data regarding 180 mothers who participated in this study. The complementary feeding based on local- food was conducted for 9 weeks, comprising 2 weeks pre-intervention, 6 weeks of intervention, and one-week post-intervention. The intervention consists of 12 sets of recipes to be made by mothers and given to their children 4 times daily over 6 weeksinstrument using Infant and Young Children Feeding Practice and Structure questionnaire. Data analysis in this study used Wilcoxon Signed Rank Test.

Results: The result of this study showed that complementary feeding based on local- food could give the impact mothers ability in food preparation and processing before complementary feeding (Z=11.644 and p-value=0.000), supplemental feeding (Z=-11.641 and p-value 0.000), and responsive feeding (Z-11.640 and p-value 0.000). The role of feeding responsiveness in accelerated growth. These results prove that self-feeding and maternal verbal responsiveness can be increased by targeting specific behaviours with appropriate behaviour change modeling and coaching practice strategies.

Conclusion: These results provide evidence that focusing on specific behaviours and implementing modification techniques such as modeling and coached practice, complementary feeding based on local food, self-feeding, and maternal verbal responsiveness can be improved.

KEYWORDS:
Complementary feeding, local food, mother ability, nutrition, stunted

INTRODUCTION

The ability of the mother to provide nourishment is intimately linked to feeding during the first two years of life. The risk of nutritional issues arises throughout this age range due to transitioning/weaning and baby feeding patterns, particularly regarding food diversity, diet quality, availability of nutrient-dense food, illness exposure, and inadequate sanitation.[1-3] In practice, mothers provide food to children based on the hunger response expressed by the child, in addition to the food menu prepared based on the wishes of the child and the use of instant complementary foods, which are considered more practical.[4–6] Responsive feeding is the ability of mothers or caregivers to actively and responsively feed children, including age-appropriate feeding methods, setting examples of healthy habits, encouraging children to eat, responding to lack of appetite, feeding in a safe environment, and using positive interaction.[7,8]

Feeding for children aged 6-24 months must be considered both in quality and quantity because during this period, children will find it difficult to switch from breastfeeding to supplementary breastfeeding or complementary foods, as well as introductions to family food for children aged over one year.[9,10] Mother's knowledge and skills are essential as a basis for fulfilling child nutrition; mothers must be able to apply parenting in terms of providing food to children (responsive feeding), which includes feeding according to the child's age, mother's sensitivity regarding the child's eating time, creating a good child's eating atmosphere and comfortable.[11,12] In the Global Strategy for Infant and Young Child Feeding, to achieve growth and development in children, mothers only give breast milk or exclusive breastfeeding until they are six months old, continue breastfeeding until they are 24 months old, and provide complementary foods for breast milk or supplemental breastfeeding. Insufficient nutritional needs are usually associated with insufficient food quantity or the presence of infection, but research shows it can occur due to various factors including parenting patterns, specifically the pattern of feeding children.[13-15]

The appropriate feeding behaviour for toddlers does not only look at the type of food provided but also includes the method, place, and time of feeding and the person who feeds it, also known as the concept of responsive feeding as

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regulated by WHO and UNICEF (2014). The practice of responsive feeding increases food acceptance and the ability to eat alone, besides that, responsive feeding includes psychosocial concepts that are good for children's mental and cognitive development.[16] Feeding practices, also known as controlling or responsive feeding practices, are actions mothers take to affect the foods their children consume. It has been demonstrated that responsive feeding techniques help kids accept new foods and develop their capacity to control how much energy they consume. To encourage healthy eating, mothers misguidedly set an example for their children by giving them energy-dense items as prizes after finishing all of their food and complimenting them. Restrictive feeding methods are linked to negative consequences, including eating meals high in energy, losing control over one's eating habits, and fussy or emotional eating.[17]

Mothers have not been trained or educated on nutrition and feeding practices but want children to have the best care and to be healthy. Mothers have expressed the need to learn strategies to encourage children to try new foods such as fruits and vegetables, manage children's food refusal, and desire to promote health. It may improve mothers' ability to practice feeding and positively impact children's nutrition. Therefore, the purpose of this study is (1) the mother's behaviours about complementary feeding before the intervention, (2) the mother's behaviours about complementary feeding after the intervention, and (3) the effectiveness impact of training on complementary feeding.

MATERIALS AND METHODS

Design and participant

This type of research is a pre-experimental design. The research design was used to analyze the effectiveness of the intervention training on complementary feeding. Research try to explain the research variable and examine the effect between variables. The impact of complementary feeding based on local-food on mother's behaviour in fulfilment nutrition stunted children. This study was conducted among mothers who have children aged 6-24 months in Public Health Centre Malang Regency, East Java, Indonesia. The population in this research are mothers who have stunted children aged 6-24 months. This study will be sampled using cluster sampling from February to June 2024. A total of 180 respondents are mothers who have stunted children ages 6-24 months participated in the study. The sampling technique in this research used randomized (cluster sampling) to recruit the participant. The sample was recruited from 6 subdistricts in rural areas with public health centers. Inclusion criteria are mothers who have stunted children aged 6- 24 months and mothers breastfeeding exclusively and registered in Integrated Health Care (in Indonesia called Posyandu). Exclusion criteria: mothers did not live at home with children and not prepare food for children.

Procedure

In conducting the research, respondents received standard care from the public health center and was given complementary feeding based on local-food intervention (used module). Complementary feeding based on local- food uses the protocols and measures outlined in the Indonesian Ministry of Health National Guidelines for Complementary Feeding. Complementary feeding based on local- should meet the following requirements: food ingredients are easy to obtain, easily processed, affordable, acceptable targets with good nutrient contentswith nutritional adequacy target and quality proteins. The program guidebook manual outlined complementary feeding based on local food activities. The complementary feeding based on local food was conducted for 9 weeks, comprising 2 weeks pre-intervention, 6 weeks of intervention, one week post-intervention, and 1 week for evaluation. Intervention consists of 12 sets of recipes to be made by mothers and given to their children 4 times daily over 6 weeks. The manual book contains WHO growth chart standard for children and recipes based on local- food as an addition to breast milk. The recipes are arramge based on selection of foodstuff, foodstuff calculation, the processing of foodstuff, how to serve food, and how to feed the children. After 8 weeks, the mothers' behaviour was observed to observe every indicator in complementary feeding.

Instrument

The main independent variable was complementary feeding based on local- food, which was assessed through a questionnaire from Infant and Young Children Feeding. Additionally, several other independent variables were under consideration, such as age, education, family type, income, and occupation. The dependent variable mother's ability to fulfill nutrition, stunted children with indicator breastfeeding, food preparation and processing, complementary feeding, and responsive feeding. Retrieval of research data used a questionnaire taken from the modification of infant and young children feeding where the instrument has been tested for validity and reliability. The validity of this research instrument obtained a value of r= 0.344, and the reliability showed that Cronbach's alpha result was 0.922 (reliable).

Data analysis

Descriptive analysis for categorical data used the frequency distribution, and for numerical data used the mean, standard deviation (SD), minimum (min) and maximum (max) value. Data were analyzed using the Kolmogorov Smirnov data normality test with p-value=0.003 so that the data was not normally distributed, and further data analysis used the Wilcoxon Signed Rank Test.

Ethical consideration

Respondents were given informed consent by signing a consent letter as a research subject for interviews and filling out questionnaire. Researchers delivered informed consent and explained the research objectives, voluntarism, and the ability to understand the information. This study received ethical approval from the Health Research Ethics Commision of the Faculty of Nursing Universitas Airlangga with protocol number 2574/KEPK/2023. Participant provided written consent for participation before data collection.

Table I:Demographic characteristic

Variable	Category	Frequency (person)	Percentage (%)
Personal factor			
Mother's age	17-25 years	51	28
	26-35 years	89	49
	35-45 years	40	22
Occupation	Housewife	155	86
	Employee	25	14
Education	Higher education	21	12
	Senior high school	84	47
	Junior high school	62	34
	Elementary school	13	7
Motivation	Strong motivation	77	43
	Low motivation	103	57
Mobility	High mobility	118	66
	Low mobility	62	34
Decision making	Good	9	5
	Enough	2	1
	Less	169	94
Knowledge	Good	99	55
	Enough	45	25
	Less	23	13
Self- esteem	High	180	100
	Low	0	0
Self- efficacy	Confidence	167	93
	Insecure	13	7

Table II:Complementary feeding on mother's behaviours in stunted children

No	Variable	Pre-couching	Post-couching	Z score	p-value
1	Food preparation and processing	35.17 ± 4.49	38.077 ± 1.23	Z= 11.644	0.000
2	Supplementary breastfeeding	63.23 ± 6.53	65.73 ± 4.10	Z= 11.641	0.000
3	Responsive feeding	44.20 ± 4.25	73.46 ± 6.27	Z=11.640	0.000

RESULTS

The study was carried out in the Malang District Health Centre with mothers under five with children aged 6-24 months experiencing stunting who participated in Integrated Health Service activities in the working area of the Malang District Health Centre, namely Tajinan Health Centre, Kepanjen Health Centre, Singosari Health Centre, Wajak Health Centre, Bululawang Health Centre in accordance with the recommendations. Five health centers were selected based on the highest number of stunting cases and randomly selected.

In the Malang Regency area, the main economic source of the community is the agribusiness sector, which includes agriculture and plantations including vegetables (tomatoes, cabbage, carrots, mustard greens, cabbage, beans, long beans, cucumbers, potatoes), rice, sugar cane, ornamental plants, wood, jabon wood, etc. In addition, Malang district is an area with livestock products, including native chicken meat and eggs, purebred chicken meat and eggs, dairy cow's milk, goat meat and milk, rabbit meat. And is an industrial area that is mostly engaged in the processing and trading of agricultural products including the refined sugar industry, the tea industry, the processed food industry (fruit chips, potato chips, and various snacks), the cutting and wood processing industry, the milk processing industry, the chicken meat processing industry.

From the Table I show that sociodemographic characteristic from personal characteristic are age, majority mothers age 25-35 years old as 49%. Mother's behaviour in fulfilling nutrition in stunting children was measured twice before and after the health coaching intervention on complementary feeding. Mentoring efforts were carried out for 2 weeks in providing nutrition to children, starting from food preparation and processing, feeding infants and children, and responsive feeding. From the results of the study, it was found that there were differences in food preparation and processing after being given a health coaching intervention with a value of Z=11,644 (p-value=0.000), supplementary breastfeeding with a value of Z-11,641 (p-value=0.000) and responsive feeding with a value of Z=11,640 (p-value=0.000)

DISCUSSION

Mother's responsive feeding behaviour in children aged 6-24 months. The working area of the Malang Regency Health Centre found that the responsive feeding behaviour of mothers in children aged 6-24 months was almost entirely well-behaved 67%, less behaved as much as 27%, and a small part well-behaved 6%. According to Notoatmodjo (2012), behaviour is a person's response or reaction to a stimulus (stimulus from outside).[18] Stimulus is a factor from outside a person (external factor), and response is a factor from within the person concerned (internal factor). Human

behaviour is included in three domains according to the purpose of education. In development, the Boom theory was modified to measure health education outcomes: Knowledge, Age, and Action.[18] According to the researcher, the responsive feeding behaviour of 20 respondents out of 30 respondents has sufficient behaviour to have positive awareness and attitude, which is obtained through eyes and ears and knowledge, possibly influenced by several factors, namely age, education, experience, and sources of information.

The mother's responsive feeding behaviour is related to education and age factors. A person's level of maturity and strength will be more mature in thinking and working, and in late adulthood, will be less sluggish in thinking because of the aging factor compared to early adulthood who are faster in thinking, receiving information, and applying information. compared to adulthood. According to researchers, the mother's responsive feeding behaviour affects a person's age and knowledge because, the older a person gets, the better the knowledge he has. This is because as a person ages, there will be physical and psychological changes. On the psychological or mental aspect, a person's mindset will become more mature and mature, so it will be easier to accept the information provided. A person's memory is also influenced by age. From the results of the study, it was found that the mother's behaviour towards responsive feeding was very influential on the growth and development of children aged 6-24 months. Less than 8 people (27%) behaved badly and 1 person (3%). Experience is an event or events that have been experienced by someone in interacting with their environment. A person's experience can be drawn from his education and work environment. Education level is one of the factors that influence or make a person's perception of ideas and technology more acceptable. According to the researcher, the mother's experience regarding responsive feeding has sufficient behaviour due to the knowledge and experience that can be taken from work directly or indirectly, on the data that has sufficient behaviour, namely not working.

Studies conducted show that there is a relationship between the mother's ability to fulfill nutrition and the growth of children aged 6-24 months.[19,20] The mother's role is very important to fulfil the nutritional needs of children, stimulating and monitoring children's growth and development. Early detection and routine growth monitoring in health care facilities is important in preventing malnutrition in children. With earlier screening in terms of measuring weight, length or height, the child's head circumference, where the risks include chronic malnutrition and stunting, it is hoped that the earlier the treatment is, the better the prognosis.[21,22] The mother's role is the main efforts to prevent and recognize stunting in toddlers. Mothers can monitor their children's growth and development by weighing them and measuring their height regularly through integrated health service activities and record medical status into health of mother and child book.

Nutritional disorders in infants and children are generally caused by poor quality and poor food feeding patterns. The mother's ability to provide food results in nutritional disorders experienced by the child which results in impaired child growth, which is caused by not being given breast milk, giving supplementary feeding too early and generally not containing enough macro and micro nutrients.[23,24] Apart from that, looking at the pattern of caring for children's food by mothers, there are still many mothers who provide prelacteal food or provide complementary feeding too early, and the quantity and quality of the nutrients provided is inadequate.[25]

The cause of growth disorders in children include incorrect and inappropriate provision of supplementary feeding as well as not meeting nutritional requirements both in terms of quantity and type in children aged 6-24 months, where this age period is a critical growth period so it needs to receive more special attention is needed. Research shows that maternal factors greatly influence nutritional status, and children born to mothers with higher education have better nutritional status than children born to mothers with low education. In addition, there are intergenerational consequences of early marriage on the welfare of children because they were born in an unsettled family's economic condition, thus affecting the development and health of children. After all, mothers are not able to meet their nutritional needs properly. The type of work and socioeconomic status, especially those who work in the agricultural sector, and also live in rural areas have a higher risk than urban residents.

Maternal autonomy in decision-making where is a factor related to maternal empowerment, especially about child health. A mother's ability to make decisions becomes a strength in maintaining health and providing household needs so that the nutritional needs of families, especially children, can be met properly. Mother's knowledge can be a barrier. In addition, related to the mother's motivational barriers, sometimes mothers feel tired, bored, feel unsure of being able to carry out their duties and roles in fulfilling nutrition for children who experience stunting. In practice, mothers provide food to children based on the hunger response expressed by the child; besides that, the food menu is prepared based on the wishes of the child, and the use of instant complementary foods are considered more practical.

The intervention of providing complementary feeding based on local food is carried out by utilizing existing local food ingredients with the use of resources owned by the family in using empty land at home as a yard. In the public health center of Wagir in Malang Regency, East Jawa, Indonesia is mostly an agricultural area such as cattle, poultry and fisheries. So it is hoped that resource utilization can be utilized optimally. Based on the research results, it show that complementary feeding based on local food can influence the mother's ability to optimally feed babies and children with indicators of food preparation and processing, feeding babies and children, responsive feeding.

This is in accordance with the recommendations for Infant Young Child Feeding (IYCF) and guidelines for feeding infants and children by the Ministry of Health (2018) where the principles of feeding infants and children include being timely, adequate, safe, and given in the correct way. Timeliness in terms of IYCF is that supplementary feeding is

given when the need for breast milk can no longer meet the baby's nutritional needs, where at the age of 6 months the child can start to be introduced to supplementary feeding. Adequate in terms of IYCF is that supplementary feeding is able to meet sufficient energy, protein and micronutrients to achieve child growth and development by considering age, quantity, frequency, consistency/texture and food variety. safe in terms of IYCF where supplementary feeding is prepared and stored in a hygienic manner, given by hand and using clean equipment. given in the correct way, in this case responsive feeding, where supplementary feeding is given on a scheduled basis, with a supportive environment and proper feeding procedures.

Infant and young children aged 6-24 months need proper food intake to achieve optimal growth and development, especially in the first 1000 days of life. Unmet nutritional needs result in babies and babies experiencing malnutrition, poor nutrition, stunting, wasting, suboptimal brain intelligence, decreased immune system and problems with stunted growth and development, even death. In babies aged 0-6 months, nutritional needs are met through exclusive breastfeeding. The content of carbohydrates, protein, fat, vitamins, minerals, cholesterol, vitamin D and fluorine contained in breast milk means that babies aged 0-6 months get a balanced nutritional intake. Entering the age of 6 months, babies already receive complementary foods to fulfill their nutritional intake. Digestion is starting to be ready to consume complementary foods for breast milk or supplementary feeding, so children can start to be given complementary foods such as biscuits or milk.[19,20,26]

Once the baby is more than 6 months old, the need for food intake is not only sufficient through breast milk. Complementary foods for breast milk need to be given to babies gradually depending on the type, quantity and texture according to the baby's age, meanwhile giving breast milk to children does not need to be stopped until the child is 2 years old. Supplementary feeding can be given to children according to the child's age, where at the age of 6-9 months the child can be given food with a soft or mashed texture, at the age of 9-12 months he can be given food with a soft texture such as strained porridge or steamed rice, and at the age of 12-24 months can be given food with a solid texture, where previously you can start with coarsely chopped food and gradually adjust it to the child's abilities until the food menu can be adjusted to the family menu.[23,24,27]

When introducing breastfeeding to children, it is recommended that in the first 2 weeks at most, porridge and single fruit be introduced with a food frequency of 1-2 times a day. This introductory period is used to introduce various sources of carbohydrates, vegetables and fruit. In the following week, children should be introduced to protein, both animal and vegetable protein and additional sources of fat in the form of fine/strained porridge which is given along with carbohydrates and vegetables with a food frequency of 2-3 times a day and they should be introduced to snacks. This principle of food variation is the basis for compiling a daily menu so that children's macro and micronutrient needs can still be met. Meanwhile, the parenting pattern in providing food in this case is responsive feeding. Responsive feeding when feeding, respond to the child with a smile, maintaining eye contact, encouraging positive words, and giving the child soft food that can be held to stimulate active self-eating (finger snacks).

CONCLUSIONS

The result of this study showed that the impact of food preparation and processing before complementary feeding based on local-food, complementary feeding, and maternal responsiveness.The role of feeding responsiveness in accelerated growth. These results provide evidence that self-feeding and maternal verbal responsiveness, can be increased by targeting specific behaviours with appropriate behaviour change strategies of modeling and coached practice. Therefore, the source of food for complementary feeding must be accessible to all communities.

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CONFLICT OF INTEREST

The authors declare they have no conflicts of interest.

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