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Feeding Complementary Foods with complete Menu Correlated with Babies Weight



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Abstract

Most children who experience failure to thrive are due to the practice of giving complementary food to breast milk with an incomplete menu, so one way to overcome this is to provide complementary food to complete menus of breast milk. This study aimed to analyze the correlation between the provision of complete menus of complementary feeding and changes in the weight of infants aged 6-12 months. This study was analytical research used a cross sectional design. This study had been conducted to 40 infants aged 6-12 months. The sample was 37 respondents. Probability sampling method with simple random sampling technique had been used as the sampling technique. This study had conducted in midwifery independent practice in Surabaya. The data collection was obtained from weighing the baby's weight, filling in the previous weight by looking at the KMS and using a complete menu complementary feeding pattern questionnaire. The data analysis used the chi square statistical test. There was a correlation between the provision of complete menu complementary foods and infant weight gain. It is hoped that health workers can increase information related to the provision of appropriate complementary food according to the needs of infants.

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INTRODUCTION

Healthy baby will experience normal growth and development in accordance with standard growth physically in general and fit stages development in accordance with her age. Disturbances in growth showed through low weight and loss *Z-Scores* according to the BB/U index. Growth disturbances is a very common occurrence that happens in the first year of a toddler's life. The incidence of *growth failure* in the first year of a toddler's life will have a negative impact on both physical and mental growth in the next toddler's life (Nugroho, 2016). Growth failure, also called *failure to thrive* or *faltering growth*, is a nutritional disorder in which a child does not reach the weight for their age. Growth, especially in terms of length and weight gain in infants, needs to be considered because disturbed growth will result in high rates of *faltering growth* in infants. The high prevalence of *faltering growth* (> 30%) mostly occurs in countries in Asia and Africa, one of which is in Indonesia. The prevalence of *growth failure* in Indonesia itself, based on the 2018 Riskesdas data, is 30.8% (Putri, 2018). Based on the 2021 Indonesian Nutritional Status Study (SSGI) conducted by the Health Research and Development Agency (Balitbangkes). The Ministry of Health, in collaboration with the Central Statistics Agency (BPS), obtained the percentage *underweight* (underweight and very underweight) in toddlers was 17%. Meanwhile, based on data from the Electronic Community-Based Nutrition Recording and Reporting Application (e-PPBGM) through the 2021 Nutrition Surveillance, 1.2% were found to be underweight and 6.1% underweight. Infants under two years that have very less weight is 1.2% and infants under two years that have very underweight 5.2% (Kemenkes RI., 2021). Based on data from the Health Profile of the Republic of Indonesia, East Java Province itself, in 2019 and 2020 the data for weighing was less effective because there were most of the areas affected by Covid-19 during the pandemic, for this reason the data has taken in 2021, found that toddlers who have very underweight 1.4% and underweight 5.5% (Kemenkes RI., 2021). In Surabaya city, based on data from the Surabaya City Health profile, in 2019, Toddlers with Underweight were 8.22%, and Skinny Toddlers (BB/TB) were 3.81%. (Dinas Kesehatan Kota Surabaya, 2019).

Based on the results of a preliminary survey that has conducted by researchers in October 2022 at the practice of independent midwives Emmy Nuryanti

S.ST., Bd Surabaya, it was found that out of 40 babies, 35 of them received complementary food for breast milk with a complete menu and 5 babies did not receive complementary food for breast milk complete menu and of the 40 babies 4 of them have decreased baby weight or are on the yellow line on the growth curve. Based on study by Wilujeng et al (2017) stated that the factors that influence the weight of children aged 6-24 months are the initial age and the type of complementary food given to breast milk. Children who receive the wrong type of complementary feeding will experience abnormal weight with a possible risk of occurrence of 13.9 times that of children who receive a complete menu of complementary feeding. The provision of complementary food for ASI must also pay attention to the nutritional needs of children. Complementary food for breast milk must include all the nutrients needed, giving priority to providing complementary food for breast milk from locally made food ingredients because it is more diverse in both texture and taste (Septikasari, 2018).

The process of growth and development can take place optimally influenced by several factors, including hereditary factors and environmental factors. From environmental factors there are *pre-natal* environmental factors and *post-natal* environmental factors, in the *post-natal* environment there are nutritional factors, culture, family socio-economic status, climate or weather, the position of the child in the family, health status, hormones, stimulation (Marmi, 2014) and factors in providing complete menu complementary food containing macronutrients and micronutrients (IDAI, 2015). The most important thing for the growth of infants and children is nutrition as a foundation for the growth of a healthy body which in turn will support healthy development. Nutrition is especially important in the first year of a baby's life. In infancy, totally dependent on caregivers for nutrition. In the long term, *faltering growth* can affect body composition, brain development, and the metabolic program of the child. So that growth monitoring needs to be carried out regularly for early detection of the risk of failure to thrive (Putri, 2018).

One strategy to increase the weight of infants aged 6-12 months is to provide complete menus of complementary foods which contain macronutrients and micronutrients. WHO states several things that must be considered in providing complementary food to breast milk, including frequency, number of doses,

texture, and type. The texture of the food must be adjusted to the condition and age of the baby so that it can be digested easily and there is no weight loss or failure to grow (*faltering growth*). This effort aims to enable Indonesian children to grow and develop optimally and maximally, accompanied by emotional, social and physical abilities that are ready to learn, and able to innovate and compete at the global level. Based on this description, the researchers were interested in knowing the correlation between the provision of complete menus of complementary feeding to changes in the weight of infants aged 6-12 months at the independent midwife practice in Surabaya.

METHODS

Observational analytics study was used as a type of this research. This study used *cross sectional design*. The population in this study were all infants aged 6-12 months, amounting to 40. The sample in this study was a portion of the population of 38

respondents. The sample size of 38 respondents with *probability sampling* technique. The *probability sampling* technique used the Simple Random Sampling system, which is a sampling technique from a population that has the same opportunity to be a respondent regardless of strata or level (Nursalam dan Pariani, 2013). The data collection instrument used in this study was a questionnaire and health cards (KMS). The data collection was obtained from weighing the baby's weight, filling in the previous weight by looking at KMS and using a complete menu complementary feeding pattern questionnaire with questions covering the content of carbohydrates, animal or vegetable protein, fat, and vitamins in one portion of food called complementary feeding, full menu. The data obtained was analyzed, where to find out there was a correlation between the complete menu complementary food variables and changes in body weight. Data processing using the *chi square test*.

RESULTS

1. General Data

a. Characteristics of respondents based on age

According to Abeshu et al (2016) the proper age to receive complementary food for breastfeeding is between 6-23 months, at which age the child has reached the general developmental stage (chewing, swallowing, digestion and secretion) which allows the child to be given food other than exclusive breastfeeding.

Table 1: Distribution of the respondents' frequency by their age

Age (months)	Frequency	Percentage (%)
6-8	16	43,3
9-11	20	54
12-23	1	2,7
Total	37	100

Source: Primary Data, 2023

Table 1 shows that out of 37 respondents, the majority (54%) of respondents were aged 9-11 months.

b. Characteristics of respondents based on gender

Purwaningrum (2012) stated that gender also influences infant/toddler food (energy) intake. Toddlers with male sex get more energy intake than female toddlers (Purwaningrum & wardani 2012 dikutip dalam ulfa, 2019).

Table 2: Distribution of respondents' frequency based on sex.

Sex	Frequency	Percentage %
Male	20	54
Female	17	46
Total	37	100

Source: Primary Data, 2023

Based on Table 2, it shows that of the 37 respondents, the majority (54%) of the respondents were male.

2. Specific Data

a. Characteristics of respondents based on body weight

According to Soetjningsih (2017) Berat badan merupakan ukuran antropometri yang terpenting, yang dipakai pada setiap kesempatan memeriksa kesehatan bayi pada semua kelompok umur.

Tabel 3: Distribusi frekuensi responden berdasarkan berat badan.

Weight	Frequency	Percentage (%)
Good	22	59,4
Less	15	40,6
Total	37	100

Source: primary and secondary data, 2023

Table 3 shows that out of 37 respondents, 59.4% of respondents had good weight.

b. Characteristics of respondents based on feeding complementary food with complete menu

According to the Indonesian Ministry of Health (2015) makanan pendamping ASI atau yang disingkat sebagai makanan pendamping asi adalah makanan complementary food for ASI or abbreviated as complementary food for ASI is food and drink that contains nutrients, given to infants or children aged 6-24 months to meet nutritional needs other than breast milk.

According to IDAI (2015) complementary foods that contain energy, protein, fat and micronutrients that can meet the macronutrient and micronutrient needs of infants according to their age are called complete menu complementary foods.

Table 4: Distribution of respondents' frequency based on the type of complete menu of complementary foods

Types of complementary foods	Frequency	Percentage (%)
Complete Menu	21	56,8
Incomplete Menu	16	43,2
Total	37	100

Source: Primary Data, 2023

Based on Table 4, it shows that of the 37 respondents, the majority (56.8%) of respondents provided a complete menu of complementary foods.

c. Cross tabulation

Cross-tabulation of the correlation between giving complete menu complementary foods to changes in body weight in infants aged 6-12 months.

Table 5: Distribution of the respondents' frequency based on the correlation between the provision of complete menus of complementary feeding to changes in the weight of infants aged 6-12 months.

MPASI	Weight Changes					
	Good		Less		Total	
	N	%	N	%	N	%
Complete Menu	15	71,4	6	28,6	21	100
Incomplete Menu	6	37,5	10	62,5	16	100
Total	21		16		37	100

Source: Primary data and secondary data, 2023

Based on Table 5, it shows that of the 21 respondents with a complete menu of complementary foods, most (71.4%) of respondents experienced good weight changes, of the 16 respondents with incomplete menus of complementary foods, most (62.5%) of respondents experienced changes underweight or constant weight.

The results of statistical tests using the *chi-square statistical* test found that the significance value of p was 0.039 <0.05, so there was a significant correlation between the provision of complete menus of complementary

food to the weight gain of infants aged 6-12 months at the practice of the independent midwife Emmy Nuryanti Surabaya.

DISCUSSION

1. Provision of complete menu complementary foods

Based on the results of study that was conducted on 37 respondents at the independent midwife practice Emmy Nuryanti Surabaya, it showed that the majority (56.8%) provided complementary food to breast milk with a complete menu. This complete menu category is if the food provided contains macronutrients (carbohydrates, protein and fat) and micronutrients (vitamins and minerals) in one serving. Most mothers have provided complementary food for ASI with a complete menu. This is very good; the nutritional needs of children will be met so that the growth and development of children becomes optimal.

The mother's habit of giving complementary food to breast milk with a complete menu at the study site was motivated by the mother's knowledge obtained from social media, health education by cadres and midwives. Based on the recommendation of the Indonesian pediatrician association (2015) regarding the provision of complementary food for breast milk which includes the quality and quantity of food. the quality of complementary food for breast milk is assessed from the completeness of food consumption, namely macronutrients and micronutrients, while sufficient quantity of food will result in good nutritional status. This is in line with the results of Nanda's research (2019) which found that there was a correlation between the behavior of giving complementary feeding and the nutritional status of infants aged 6-24 months at the Integrated Healthcare Center in Bandung, Mojokerto on 4-11 May 2019. There was a correlation between the behavior of providing complementary feeding and the nutritional status of infants aged 6 -24 months in Integrated Healthcare Center in Bandung, Mojokerto.

Data on the age of children shows that the majority (54%) of respondents are aged 9-11 months. The most common complementary food for breast-feeding at the study site was found at the age of 9-11 months, this is because for infants aged 6-8 months, mothers provide fortified complementary food for breast-feeding and a single menu, that is rice porridge. Age can also be used as a benchmark by mothers to determine the texture of complementary foods, including at the age of 6 months the types of pureed and thick foods, at the age of 9 months are soft foods, at the ages of 10-24 solid foods.

Complementary food for breastfeeding is given because the child's need for nutrition for growth cannot be fulfilled only by giving breast milk, but if it is given early it can result in diarrhea or constipation, this is because the digestive ability of children who have not received additional food other than breast milk (Mufida, dkk, 2015). Meanwhile, in terms of gender, it was found that most of the data (54%) of the respondents were male. Even though in theory complementary feeding is not affected by gender, in general the male sex will require more energy than the female. Because the activity of boys usually moves more actively than girls, so the energy they need is different between boys and girls. According to the theory of Meryana & Wijatmadi (2012), the energy which person needs depends on several factors including gender, in general men need more energy than women. At the age of children, more energy is needed than other age groups because at this age the body needs it for body growth. Like physical activity, the heavier the activity carried out by a person, the more energy will be required (Meryana & Wijatmadi 2012 quoted in lestari 2019) the type of menu is no different from that of girls but mothers can provide more complementary foods to breast milk.

2. Baby's weight

The results showed that the majority (59.4%) of respondents aged 9-11 months had a good change in weight. the results of the researchers concluded that the high change in body weight was categorized as good if the change in body weight was increased. Changes in body weight can be seen from the growth chart on the card for health (KMS) in the previous month compared to the current body weight so that changes in body weight can be seen at this time. According to the theory of Astriana & Suryani (2017), one of the most important indicators in assessing growth in infants is to assess the baby's weight. Based on the results of study that was conducted on 37 respondents at Emmy Surabaya's independent midwife practice, most (54%) of the respondents were aged 9-11 months, and almost half (43.3%) of the respondents were aged 6-8 months and a small proportion of respondents (2,7%) of respondents aged 12 months.

Measurement of baby's weight is used as a benchmark for a child's growth status, namely through a comparison of weight for age and weight

for height. This measurement is carried out once a month, midwives or cadres can enter the data into the health card (KMS). Measurement results and data interpretation can be conveyed to the mother. According to Sugiharti's theory (2016), one of the manifestations of growth is body weight. At the age of 6-12 months is a period of very fast growth, so it is necessary to maintain the baby's weight according to age. Meanwhile, according to Soetjningsih's theory (2017), body weight is the most important anthropometric measure, which is used at every opportunity to check the health of babies in all age groups.

3. The correlation between giving full menu solids and weight changes

The results of the chi square statistical test showed a significance p value of $0.039 < 0.05$, which means that there is a correlation between the provision of complete menu complementary feeding to the weight gain of infants aged 6-12 months at the practice of independent midwives Emmy Surabaya. This shows that the provision of complete menu complementary food to infants is a factor that influences changes in body weight. Providing a complete menu of complementary foods containing macronutrients (carbohydrates, proteins and fats) and micronutrients (vitamins and minerals) in one serving of food can increase body weight. According to *evidence based* on the introduction of complementary feeding, that a complete menu can meet the nutritional needs of infants, complementary feeding of complete menus can also meet the daily caloric energy needs of infants (Santri et al, 2014). The results of El hadji's study Energy intake is greater from ready-made foods that contain complete nutrition than from a diet of foods containing only milk, this high energy intake in the ready-made foods group is likely related to the high energy density. (el hadji at al, 2003) Solid foods do not simply replace infant formula but increase energy intake. Time of introduction of solid food has little influence on infant growth (Veite Grote, 2011). Besides that delay in providing a complete menu will cause children to tend to like certain tastes and are picky about food, thus causing the child not to get enough nutrition (IDAI, 2015). Delaying introduction of complementary foods are associated with lower odds of rapid infant weight gain (Wood at al, 2021) On the other hand, children who receive various and natural complementary foods will choose healthy foods with

a balanced menu in the future to meet their nutritional needs (IDAI, 2015). Therefore, it is necessary to emphasize proper feeding of infants and children by providing appropriate complementary foods according to WHO and UNICEF recommendations (IDAI, 2015).

Recommendations for providing complementary feeding according to IDAI (2015), unbalanced food consumption has the risk of causing certain macronutrient or micronutrient deficiencies if the problem is not handled properly, the child can experience failure to thrive. Whereas according to theory Soetjningsih (2019), that there is a correlation between giving complementary food to breast milk and the nutritional status of children aged 6-24 months at Posyandu. Children's nutritional needs include macronutrient needs including: carbohydrates, proteins and fats in large quantities, while micronutrients including vitamins and minerals are needed in smaller amounts. Both of these nutrients are equally needed by children. And this can be fulfilled through the provision of complete menu complementary foods. This is supported by Widaryanti's research (2019), which shows that most babies who experience stunting have a background of inappropriate complementary feeding. Other research data shows that almost half (28.6%) of respondents who provide complete menus of complementary food to breast milk experience less weight changes. According to the researchers, one of the factors in providing complete menu complementary feeding that affects changes in body weight was less weight change, according to researchers because changes in body weight can be directly influenced by food intake such as provision of complete menu complementary feeding and infectious diseases. so that if the child has been given complementary food, a complete menu that is appropriate, namely there are macronutrients and micronutrients, they are still experiencing weight loss, it could be an infectious disease that plays a role in the baby experiencing a decrease in body weight.

Unicef (1999) in Ghinanda (2022), stated that there are two factors that affect nutritional status and infant growth, namely nutritional intake and the presence of infectious diseases. These two factors have a synergistic correlation where lack of nutrients can cause low body resistance so that it is susceptible to infection, conversely infectious diseases can cause malnutrition. on the results of Ghinanda's research (2022), that feeding patterns have a close correlation

with the nutritional status of toddlers. In the opinion of Widaryanti (2019), proper and good provision of complementary food for breastfeeding is so that the nutritional needs of children are met so that failure to thrive does not occur. the complementary food given to breast milk must also be varied, given gradually from mashed, mushy forms until you become accustomed to family food. in his research showed that babies who are stunted do not get the right complementary food for breast milk. Other data from the results of the study also showed the opposite, that almost half (37.5%) of respondents who received complementary food for breast milk did not experience a complete change in weight or gain. If seen from the distribution of questionnaires, most mothers give babies formula milk, it is this formula milk that is possibly the cause of weight gain in some babies who do not get complementary foods with incomplete menus.

CONCLUSION

The result of this study found that there was a correlation between the provision of complete menu complementary foods with changes in baby's weight.

SUGGESTION

It is hoped that workers in the health sector especially in the practice of independent midwives can improve the programs that have been implemented and provide assistance to mothers during complementary feeding.

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CONFLICTS OF INTEREST

The authors declared there was no conflict of interest during the process until the publishing of the study.

AUTHOR CONTRIBUTIONS

All authors have contributed to this study process, including conception and design, analysis and interpretation of the data, drafting of the article, critical revision of the article for important

intellectual content, final approval of the article, collection and assembly of data.

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