



Dietary Diversity among Children Aged 12-23 Months in Urban Area

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Abstract

This study aimed to describe the dietary diversity among 12-23 months old children living in an urban area. A cross-sectional survey which involved 146 mothers who had children aged 12-23 months, living in Surabaya City, East Java, was conducted. Mother's, child's, household's characteristics, and child's dietary diversity were collected by using a questionnaire. Then, the frequency distribution and percentage analysis were performed. The result showed that most children (96.6%) met the minimum dietary diversity as recommended by WHO. The food groups which mainly consumed were vitamin A-rich fruits and vegetables (100%) and grains, roots, and tubers (96.6%). In reverse, the food groups which less consumed were other fruits and vegetables, and legumes and nuts. Integrated health promotion is needed to ensure low socioeconomic status household who lived in the urban area met the appropriate infant and young child feeding practice.

Keywords: *Dietary diversity; Children aged 12-23 months; Urban area.*

Introduction

Appropriate complementary feeding practice in the first two years of child's life is essential to support their optimal health, growth, and development [1]. After exclusively breastfed until six months old, infants should receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or beyond [2]. World Health Organization (WHO) has published the guidelines for appropriate complementary feeding practice. It mentioned that children should be introduced to solid, semisolid, or soft foods at the age of six months, and should get the minimum meal

frequency, dietary diversity, acceptable diet, and iron-rich foods [3, 4]. Failure in meeting the child's nutritional needs, especially during the critical period (6-23 months old), can lead to malnutrition [5]. The consequence of malnutrition includes physical growth failure, intellectual retardation, developmental delay, micronutrient deficiencies, and adverse outcomes in the future (such as reduce productivity and endurance). It also increases the child's morbidity and mortality [6-8]. Good complementary feeding practice for children 6-23 months old is critical to achieving the

global target of reducing by 40% the number of stunted under-five-year-olds-from about 171 million in 2010 to about 100 million-by 2025 [9]. In Indonesia, child's complementary feeding practice is still inadequate [10]. Dietary diversity is an indicator of dietary quality and the extent to which an individual's nutritional needs are being met [11]. By 2013, the Ministry of Health reported that only 34% and 43% of breastfed and non-breastfed children aged 6-23 months, respectively, are fed according to the WHO recommendations [12].

By 2018, only 46.6% of children aged 6-23 months who received a diverse diet. This proportion is increased as well as the child's age [13]. However, disparities have been noted between locations and socioeconomic characteristics. The geographical location influenced the child's feeding behaviour [14]. The previous study mentioned that children in the urban area tend to meet the recommended dietary diversity as the mother have a good knowledge and awareness on infant and young child feeding practice.

Their mother also has excellent access to media which promote the importance of complementary feeding practice and easy access to the markets to buy foods [15]. The other studies revealed that urban or rural children similarly unmet minimum dietary diversity as recommended by WHO [16], [17].

In reverse, another study stated that rural children were more likely to achieve minimum dietary diversity compared to urban children [18]. However, there is limited information about dietary diversity among children aged 12-23 months old in the urban area of Indonesia. Therefore, this study aimed to describe the dietary diversity among 12-23 months old children living in an urban area.

Consumption of all food groups were higher among older children (18-23 months) Consumption of all food groups were higher among older children (18-23 months) Foods made from grains are the leading complementary food (76.8% of children). Only 33.2% of children are fed fruits and vegetables rich in vitamin A, and a mere 17.1% are fed complementary foods containing meat, fish, poultry and eggs.

Methods

Study Design, Setting, and Sampling Technique

This was a descriptive research with a cross-sectional approach. The population were a mother who had children aged 12-23 months, living in Surabaya City, East Java and had registered as a member of Posyandu Balita (Integrated Health Care Center for Children Under Five Years). By using a multistage random sampling technique, 146 samples were included in this study.

At the first stage, randomization was conducted by entering the name of puskesmas (primary health care centre) across Surabaya City into a fishbowl. Six puskesmas then selected to be used as a study area. At the second stage, team select respondents randomly by using the register book of Posyandu Balita. The number of samples was equal in each area (24-25 respondents).

Data Collection

Data were collected by using a structured questionnaire with four different sections, includes the mother's characteristics, child's characteristics, household's characteristics, and child's dietary diversity. Mother's characteristic includes the mother's age and mother's level of education. Mother's age were divided into 15-19; 20-24; 25-29; 30-34; 35-39;

40-44; 45-49 years old [16, 19]. Mother's level of education was classified as uneducated/primary; secondary/higher; diploma or university level [20]. Child's characteristic includes the child's age, sex, and birth order. Child's age were categorized into 12-17; 18-23 months old [3, 16, 21].

Child's sex was classified into male or female [22, 23]. Child's birth order was divided as first; second; third; fourth children [21, 24]. Household's characteristic, include household socioeconomic status (SES), which assessed by the comparison between family monthly income and the regional minimum wage of Surabaya City [25]. It was divided into low (if less than the regional minimum wage of Surabaya City) and high (if equal or higher than the regional minimum wage of Surabaya City).

Child's minimum dietary diversity defined as the proportion of children aged 12-23 months who receive food at least from 4 of 7 groups of food, as follows: 1) grains, roots and tubers; 2) legumes and nuts; 3) dairy products (milk, yoghurt, and cheese); 4) flesh foods (meat, fish, poultry, and liver/organ meats); 5) eggs; 6) vitamin-A rich fruits and vegetables; and 7) other fruits and vegetables. The instrument used was standardized by WHO, consist of 17 questions.

The answers were coded "1" for Yes, "2" for No, and "8" for Do not know [3, 4]. Respondents were coded 1 if their IYCF practice met the WHO guidelines for minimum dietary diversity or code 0 if the respondent's unmet the guidelines[11, 22].

Ethical Considerations

This study was reviewed and ethically granted by Health Research Ethical Commission, Faculty of Nursing, Universitas Airlangga, East Java, Indonesia. Written consent was obtained from all respondents before the survey.

Data Analysis

The frequency distribution and percentage analysis were performed in this study. It was used to describe the dietary diversity among children aged 12-23 months in the urban area of Indonesia.

Results

Table 1 presented that many respondents were in the age bracket of 20-24 years (32.2%). Most respondents had attained a secondary or higher level of education (72.6%). The child's characteristics were mostly aged 18-23 months (56.2%), female (63.7%), and being the first children on their household (47.9%). More than half of respondents were living within a low socioeconomic household (59.6%).

Table 1 The characteristics of respondents

Characteristics	n=146	%
Mother's age		
15-19	3	2.1
20-24	47	32.2
25-29	45	30.8
30-34	25	17.1
35-39	22	15.1
40-44	3	2.1

45-49	1	0.7
Mother's level of education		
Uneducated/primary	16	11.0
Secondary/higher	106	72.6
Diploma/university degree	24	16.4
Child's age		
12-17 months old	64	43.8
18-23 months old	82	56.2
Child's sex		
Male	53	36.3
Female	93	63.7
Child's birth order		
First	70	47.9
Second	60	41.1
Third	14	9.6
Fourth	2	1.4
Household SES		
Low	87	59.6
High	59	40.4

Table 2: The frequency distribution and percentage of child's dietary diversity

Variables	n=146	%
Child's dietary diversity		
Unmeet	5	3.4
Meet	141	96.6

Table 3 The distribution of type of food group consumed by the children in the last 24 hours

Food groups	n=146	%
Grains, roots, and tubers		
No	5	3.4
Yes	141	96.6
Legumes and nuts		
No	40	27.4
Yes	106	72.6
Dairy products (milk, cheese, yoghurt)		
No	8	5.5
Yes	138	94.5
Flesh foods (meat, liver/organ meats, poultry, fish)		
No	13	8.9
Yes	133	91.1

Eggs		
No	20	13.7
Yes	126	86.3
Vitamin-A rich fruits and vegetables		
No	0	0.0
Yes	146	100.0
Other fruits and vegetables		
No	41	28.1
Yes	102	69.9

The frequency distributions and percentage of child's dietary diversity had shown in Table 2. Almost all respondents meet the minimum dietary diversity recommended by WHO on their children's diet, in the last 24 hours. Table 3 showed that all children consumed vitamin-A rich fruits and vegetables (100%) and predominantly consumed grains, roots, and tubers (96.6%). The food groups which less consumed were other fruits and vegetables (28.1%), then legumes and nuts (27.4%)

Discussion

The present study was aimed to describe the dietary diversity among 12-23 months old children living in an urban area, in East Java, Indonesia. The study found that appropriate dietary diversity among children living in the urban area was achieved. Most children consumed at least six food groups on the previous day. Similar findings were stated by previous study [14], [26], [27]. The living area of household influenced their consumption behaviour.

The urban household has good access to diverse foods compared to the rural household [28]. As the capital of East Java Province and the second big city of Indonesia, Surabaya becomes the city of industry and trade [29].

It means the availability of various food is also abundant in this area. The higher proportion of children who met the minimum dietary diversity recommended by WHO found in this study also possible as we only involved children aged 12-23 months old.

The previous study revealed that the last 24-hour diet of children >1 year already comply with the guidelines of infant and young child feeding practice by WHO [27, 30]. Most mothers give only tubers and grains to their 6-11 months old children. After the child reached 12 months old, mothers begin to introduce more varied foods [31].

As children got older, their ability to digest particular food, such as animal and plant-source food is increased [15, 32]. So, the mother has many choices of food given to their children [14, 33]. Mother was then more confident in delivering appropriate diverse diet to their children.

The study revealed that food group consumed by all children aged 12-23 months old living in an urban area is vitamin A-rich food, includes leafy-green vegetables (spinach, bok-coy), vitamin-rich tubers (carrots, sweet potato, pumpkin) and fruits (mango, papaya, jackfruit). The previous study found that the most consumed vegetables by children are

those which are red and orange, and also have a sweeter taste, such as tomatoes, carrots, and pumpkins [34].

It also might be correlated with the household's socioeconomic status. The previous study conducted in low-income communities also mentioned tubers, fruits, and vegetables as the most prominent food groups consumed. Vitamin-rich tubers, such as sweet potato or pumpkin, were often consumed as a staple food substitute in these communities [35].

However, season and climate also play a role in the availability of seasonal vegetables and fruits [36]. As our study conducted in mango and jackfruit season, the availability of these fruits in the market is enormous with low price. So, it is affordable for low socioeconomic status mothers to be delivered to their children.

The second dominant food group consumed by 12-23 months old children the day before the survey were grains, roots, and tubers. These findings are similar with the previous study which mentioned that the main food delivers to the children were made from grains, such as rice porridge and bread [11, 15, 27, 31, 37]. In Indonesia, rice is considered as the essential staple food [38].

So, rice will always be provided in every child's meal. In reverse, the food groups which less consumed by children aged 12-23 months were other fruits (includes apple and avocado) and vegetables (includes eggplant, peas, and luffa). It is also similar with previous study findings [11, 14, 15, 31].

Most children reject eggplant and peas because of their colour and taste [34]. So, these vegetables were less offered to children by a high percentage of parents.

Regarding our findings, animal-sourced protein (eggs, flesh foods) were commonly consumed rather than plant-sourced protein (legumes and nuts). Previous study also mentioned the same findings [31, 37, 39].

Food groups consumed in the coastal area were dominated by meat, fish, and egg [40]. Surabaya City is located in the coastal area of East Java. Therefore, fish were easily available at low prices.

The strength of this study includes 1) the use of internationally standardized questionnaires with high validity and reliability [4] and 2) the overview of children aged 12-23 months food groups consumption which rarely described. However, this study had limitations includes: 1) child's dietary diversity was measured by asking the mother to recall the child's meal in the previous day, which increases the opportunity of information bias; and 2) the use of checklist food questionnaire can not correctly measure the quantity of food consumed by children.

Conclusions

In summary, our findings indicate that children aged 12-23 months in the urban area received minimum diverse diet as recommended by WHO. An integrated health promotion which empowers mother, mostly who lived on a low socioeconomic status household in the urban area, who at risk of delivering inappropriate infant and young child feeding practice, is still needed. Further study should measure the amount of food consumed by children to ensure it meets not only the food groups consumed, but also meet the recommended dietary allowance.

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