**ABSTRACT**

Nutritional problems in adolescents are still one of the reproductive health problems in Indonesia due to the fulfillment of nutritional needs. One of the factors that can affect diet is the role of the mother. This study aims to determine the role of mothers in meeting the nutritional needs of adolescent girls' nutritional status. This study was conducted at SMAN 3 Malang using cross sectional study with the subject of 75 adolescents who were selected by simple random sampling method. Information about the characteristics and role of mothers in meeting nutritional needs was obtained using a questionnaire with structured interviews. Data on weight, height, and MUAC were obtained by measurement. Data analysis was performed using univariate and bivariate methods. The results showed 14.67% of adolescents with low nutritional status, 13.3% of adolescents with over nutritional status, and 72% of adolescents with normal nutritional status. Besides, the results obtained 74.67% of adolescents did not experience chronic energy deficiency (CED), and 25.33% experienced CED. From the results of the bivariate analysis, it was found that there was a relationship between the role of the mother in meeting nutritional needs with the nutritional status based on BMI / age (0.021) and nutritional status based on arm circumference (0.002). Mothers have an important role in paying attention to the quality and quantity of food, including adolescents in terms of preparing, processing, serving, shaping eating patterns, and creating pleasant situations when eating.

**Keywords:** fulfillment of nutrition, adolescents' nutrition status, mother's role.

**INTRODUCTION**

The results of the 2015 Inter-Census Population Survey show that the population aged 15-24 years is 16.5% of the total population of Indonesia and will experience an increase until 2030 (Demographic Institute FEB UI, 2017). The large proportion of adolescents will greatly affect development from social, economic, and demographic aspects. Adolescence is a period of rapid growth and development. Adequate nutrition is a vital need for humans, especially adolescents, which is a period of significant physical, physiological, and social role changes.
Basic Health Research 2010 showed that as many as 54.5% of adolescents consume foods below 70% of the Nutrition Adequacy Score (NAS) is recommended in 2004 (MOH RI, 2010). Data from Basic Health Research indicates the number of chronic energy deficiency (CED) was highest in the age range of daughter 15-19 years as much as 30.9% in 2007 and an increase to 46.6% in 2013 (Ministry of Health of Indonesia, 2013). Meanwhile, obesity or overweight is another challenge. The prevalence of obesity in adolescents aged 16-18 years in Indonesia has increased from 1.4% in 2010 to 7.3% in 2013 (RI BPPK, 2012). The imbalance between the needs and nutritional intake of adolescents plays an important role in their growth and development and can cause problems in reproductive health.

Adequate nutrition is a vital need for humans, especially adolescents, which is a period of significant physical, physiological, and social role changes. A further impact, lack of nutritional intake can also cause reproductive system disorders. This nutritional problem occurs because of an imbalance between nutritional needs and intake. This is exacerbated by the existence of an unhealthy diet with intake restrictions that many adolescents do in their diet which will lead to insufficient nutritional fulfillment in adolescents (N et al., 2011). In excess nutrition (overweight) can cause diseases related to eating patterns (diet-related disease) such as diabetes, heart disease, hypertension, stroke, and other (non-communicable disease non-communicable disease) (WHO, 2013).

Nutritional intake must be considered to reach sexual maturity. Balanced nutrition will determine the health of the reproductive organs. In adolescence, nutritional intake can affect nutritional status. A good nutritional status can support the optimal function of the reproductive organs. Nutritional problems in adolescents are serious, but adolescents are still a neglected group. Most studies of malnutrition in developing countries have focused on children or during pregnancy. Very few population-based studies have examined the prevalence of nutrition in adolescents (Cordeiro et al., 2014). Programs for adolescents are still very limited in dealing with nutritional problems. Programs related to youth by the health department, namely the Youth Care Health Program (PKPR) have not been effective in all public health centers in Indonesia (Agustini & Arsani, 2013)and do not specifically target adolescent nutrition problems. Policies related to nutrition are still general in nature with the main target being the First 1000 Days of Life (HPK) group, especially for children under five years of age (toddler). The nutrition program has not yet targeted premarital girls as targets (RI Ministry of Health, 2012). Most of the research on adolescents pays more attention to the problem of descriptive description of adolescent nutritional status but does not pay attention to the role of mothers in meeting nutritional needs.
METHOD

The research design was a cross-sectional study which was conducted in SMAN 3 Malang City with the subject of 75 young women who were selected by simple random sampling method. Data collection was carried out for two months (October-November 2018) by the researcher herself and two other enumerators. Data on the characteristics and roles of mothers in meeting nutritional needs were obtained using a questionnaire with structured interviews. Data on weight, height, and weight were obtained by measurement. Data analysis was performed univariate and bivariate using STATA 12.0. Bivariate analysis to obtain p-value to determine the relationship between the role of mothers in meeting nutritional needs with the nutritional status of adolescent girls (BMI/age and arm circumference). This research has obtained ethical feasibility from the Ethical Commission of Poltekkes Kemenkes Malang.

RESULTS

The following table presents the characteristics of the respondents including age, height, weight, and arm circumference

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean±SD)</td>
<td>15.39±0.49 years</td>
</tr>
<tr>
<td>15 years</td>
<td>46 (61.33)</td>
</tr>
<tr>
<td>16 years</td>
<td>29 (38.67)</td>
</tr>
<tr>
<td>Height (Mean±SD)</td>
<td>156.64±4.76 cm</td>
</tr>
<tr>
<td>Body Weight (Median, IQR)</td>
<td>52.6 (45.8-57.9) kg</td>
</tr>
<tr>
<td>Arm Circumference (Median, IQR)</td>
<td>25 (23.5-26.5) cm</td>
</tr>
</tbody>
</table>

Based on table 1 it can be seen that most respondents are in the 15 years age group (61.33%) with a mean value of 15.39±0.49 years. The mean height of the respondent is 156.64±4.76 cm, the median of the respondent's body weight is 52.6 (45.8-57.9) kg, and the median of the respondent's arm circumference is 25 (23.5-26.5) cm.

<table>
<thead>
<tr>
<th>Variables</th>
<th>f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI/Age (median, IQR)</td>
<td>0.31 (-0.641-1.12) 11 (14.67)</td>
</tr>
<tr>
<td>ArmCircumference (Median , IQR)</td>
<td>25 (23.5-26.5) cm</td>
</tr>
<tr>
<td>CED</td>
<td>19 (25.33)</td>
</tr>
<tr>
<td>Non-CED</td>
<td>56 (74.67)</td>
</tr>
</tbody>
</table>
Based on table 2 it can be seen that most of the respondents are in normal nutritional status (72%). When viewed from the distribution of CED status, most of the respondents did not experience CED (74.67%).

**Table 3 Role of Mothers in Meeting the Needs of Nutrition with Nutritional Status Based on BMI/Age**

<table>
<thead>
<tr>
<th>Role of Mothers in Need Fulfillment Nutrition</th>
<th>Nutritional Status (BMI/Age)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>less f (%)</td>
<td>Normal f (%)</td>
</tr>
<tr>
<td>Poor</td>
<td>6 (54.55)</td>
<td>7 (12.96)</td>
</tr>
<tr>
<td>Fair</td>
<td>5 (45.45)</td>
<td>31 (57.41)</td>
</tr>
<tr>
<td>Good</td>
<td>-</td>
<td>16 (29.63)</td>
</tr>
</tbody>
</table>

Based on table 3 it can be seen that 54, 55% of respondents with the role of mothers in fulfilling nutritional needs in the under-nutritional status category, 57.41% of respondents with the role of mothers in meeting nutritional needs in the moderate category, including in normal nutritional status, and 50% of respondents with the role of mothers in fulfilling needs nutrition in the adequate category is included in the over nutritional status. Statistically, there is a significant relationship between the role of the mother in meeting nutritional needs and nutritional status based on BMI / age (p> 0.05).

**Table 4 Mother's Role in Fulfilling Nutritional Needs with Nutritional Status Based on Arm Circumference**

<table>
<thead>
<tr>
<th>Mother's Role in Fulfilling Nutritional Needs Nutritional</th>
<th>Status (Arm Circumference)</th>
<th>Value p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CED f (%)</td>
<td>Non CED f (%)</td>
</tr>
<tr>
<td>Less</td>
<td>9 (47.37)</td>
<td>7 (12.50)</td>
</tr>
<tr>
<td>Enough</td>
<td>9 (47.37)</td>
<td>32 (57.14)</td>
</tr>
<tr>
<td>Good</td>
<td>1 (5.26)</td>
<td>17 (30.36)</td>
</tr>
</tbody>
</table>

Based on table 4, it can be seen that 47.37% of respondents with the role of mothers in meeting nutritional needs are in the deficient category experiencing CED, 47.37% of respondents with the role of mothers in meeting nutritional needs in the good category experienced CED, and 57.14% of respondents with the role of mothers in meeting nutritional needs in the moderate category did not experience CED. Statistically, there is a significant relationship between the role of the mother in meeting nutritional needs and nutritional status based on arm circumference (p> 0.05)
DISCUSSION

Nutritional problems are the underlying factors for various health problems. Nutritional problems can occur in all age groups, even nutritional problems in a certain age group will affect nutritional status in the next life cycle period (intergenerational impact) (FKM UI, 2007). One of the nutritional problems that occur in adolescents is their DBM (double burden of malnutrition). Based on the results of research conducted at SMA Negeri 3 Malang City in October 2018, it shows that 14.67% of adolescent girls are categorized as under nutritional status (BMI/Age < -2 SD) and 13.33% of girls are categorized as over nutritional status. (BMI/Age > 2 SD). Besides, 25.33% of adolescent girls experience CED which is marked by arm circumference <23.5 cm. A person's nutritional status is determined based on nutritional consumption and the body's ability to use these nutrients. Normal nutritional status indicates that the quality and quantity of food that meets the body's needs (Indriasari, 2013). Undernutrition is caused by an imbalance between energy intake and nutritional needs, resulting in a negative imbalance, namely the intake is less than the need. Meanwhile, more nutrition occurs due to a positive imbalance, namely when the energy intake is greater than the need (Zuhdy, 2015).

The impact of DBM is very serious and its manifestations can be seen throughout a person's life. A person who survives with nutritional problems will live in critical times. Health problems caused by malnutrition in the early stages will have a lifelong impact (World Bank, 2012). In excess nutrition (overweight) can cause diseases related to eating patterns (diet-related disease) such as diabetes, heart disease, hypertension, stroke, and other (non-communicable disease) (WHO, 2013).

One of the nutritional problems that occur in adolescents is chronic energy deficiency. CED is a condition of suffering from a shortage of food that lasts for a long time or years which results in health problems with signs or symptoms, including weakness and a pale face (Marlenywati, 2010). One of the anthropometric tests that can be used to determine nutritional status is the measurement of arm circumference (Almatsier, 2011) The percentage of the incidence of CED in young girls in this study was 25.33%. This figure is higher when compared to the prevalence of CED in Indonesia in 2018 of 14.5%, but lower than the prevalence of CED in non-pregnant women in the 15-19 year age group, which is 36.3% (Ministry of Health of Indonesia, 2018). Nutritional problems in adolescents have a major impact on the health and safety of pregnancy and birth if the adolescent becomes a mother: This indicates that more comprehensive prevention efforts related to CED are still very much needed considering the impact of CED on adolescents who will later become
mothers.

Growth in adolescence is also influenced by the intake of nutrients consumed in the form of food. Diet is a way of eating both at home and outside the home, which includes the frequency and timing of meals, the type and amount of food consumed, including preferred foods, and dietary restrictions (Suhardjo, Hardinsyah&Riyadi, 1998). Teens who live with parents will get special attention regarding their diet. This is because the mother plays an important role in providing nutritious food for the family so that it influences the nutritional status of the child (Lazzeri, 2006; Rina & Oktia, 2008). Sufficient knowledge and skills should be possessed by mothers as capital in fulfilling nutrition for children.

One of the factors involved in fulfilling nutritional needs is the role of the mother. During infancy and toddlerhood, mothers have an important role to play in paying attention to the quality and quantity of food consumed by children by accustoming to a balanced and regular diet every day, according to the level of adequacy. Previous research at TK Dharma Wanita Persatuan 2 Tlogomas Malang showed a relationship between the role of mothers in fulfilling children's nutrition and nutritional status of preschool children (p-value <0.001). There has been no previous research related to the role of mothers in meeting nutritional needs with the nutritional status of adolescent girls. This study shows that there is a significant relationship between the role of parents in meeting nutritional needs with nutritional status based on BMI / age and arm circumference (p-value <0.05). The role of a mother is very important or needed in fulfilling nutrition in children. Mothers in particular must be able to shape children's diets, create pleasant situations, and serve attractive foods to meet the nutritional needs of their children. The role of mothers in meeting nutritional needs is shown in terms of preparing food menus for children, processing food menus for children, presenting food menus for children, forming children's diets, and creating pleasant situations when eating.

In line with the increasing adolescent population in Indonesia, the problem of adolescent nutrition which is included in the double burden of malnutrition needs special attention because it affects the growth and development of the body and its impact on adult nutrition problems (Pudjiadi, 2005;Nursari, 2010). National development requires quality human resources (HR) with the application of balanced nutrition (MOH RI, 2005). Good nutrition will produce quality, healthy, smart, and productive human resources. Improvements in nutrition are needed throughout the life cycle, starting from pregnancy, infants and toddlers, pre-school, elementary school children, adolescents, and adults to old age. Efforts to improve nutritional status for the development of quality human resources must be started as
CONCLUSION

Nutritional problems in adolescents, both malnutrition and overnutrition, are caused by the intake of nutrients consumed. The role of mothers is very important in meeting the nutritional needs of adolescents, both in terms of preparing food menus for children, processing food menus for children, presenting food menus for children, forming children's diets, and creating pleasant situations when eating.

ABBREVIATIONS

SMA Negeri 3 Malang

COMPETING INTEREST

No conflict of interest

AUTHORS’ CONTRIBUTION

The corresponding authorconceptualized, designed, prepared the initial draft and framework also interpreted the data under advice of supervisor from Midwifery Departement Politeknik Kesehatan Kemenkes Malang.

ACKNOWLEDGMENT

This paper and the research behind it would not have been possible without the exceptional support of my supervisor.

REFERENCES

Agustini, N., & Arsani. (2013). NLKA Healthy Youth through Youth Care Health Services at the Community Health Center Level. J. Public Health, 9, 66–73.


Demographic Institute FEB UI. (2017). “Prioritize Adolescent Reproductive Health to Enjoy the Demographic Bonus.”


Indriasari, R. (2013). Relationship between Nutritional Intake and Nutritional Status of Young Women at the Faculty of Public Health, Hasanuddin University Makassar in 2013. Hasanuddin University Makassar.


https://doi.org/10.1017/CBO9781107415324.004


RI BPPK. (2012). *Results of Riskesdas 2013*.


Zuhdy, N. (2015). Relationship between Physical Activity Patterns and Diet Patterns with Nutritional Status in Class 1 High School Girls in North Denpasar.