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Nutritional status and anxiety levels of adolescent during COVID-19 pandemic

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ABSTRACT

The COVID-19 pandemic has had various health impacts, experienced by all age groups. However, many health problems are experienced by adolescents. The nutritional and psychological issues of teenagers during the COVID-19 pandemic require additional investigation. This study seeks to investigate the nutritional status and anxiety levels of teenagers during the COVID-19 pandemic. The cross-sectional research. Boys and girls aged 14-18 years became the research subject, who was chosen by using incidental sampling. The independent variable is nutritional status. The variable is anxiety. The data was collected by distributing a questionnaire, the assessment of nutritional status using body mass index, and self-rating anxiety scale (SAS/SRAS) for psychological status. It reported that there is no influence between nutritional status and anxiety in adolescents ($p>0.05$). There is no influence between nutritional status and anxiety in adolescents.

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1. INTRODUCTION

Coronavirus disease (COVID-19) is an infectious ailment caused by the severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) virus, which started its transmission in Indonesia near the close of 2019. The COVID-19 epidemic affects each age demographic differently. The pandemic has also impacted adolescence, a crucial phase characterized by fast growth and development, essential for the adoption of health-related habits. This behavior will develop over time, which may lead to the development of non-communicable diseases related to nutrition in adulthood. Research shows the existence of unhealthy eating habits and lifestyles in children and adolescents. Adolescents are prone to stress that causes anxiety, one of which is caused by puberty. In Indonesia, the prevalence of anxiety disorders over the age of 15 years is 9.8% [1]–[4].

Malnutrition is still an important medical issue. The double burden of malnutrition caught the world's attention. Malnutrition, including undernutrition and overnutrition (overweight and obesity), is an important health problem in Indonesia. There are 8.7% of adolescents aged 13-15 years and 8.1% of adolescents aged 13-24 years under the thin and extremely thin classifications. The prevalence of overweight and obesity was 16.0% among adolescents aged 13-15 years and 13.5% among those aged 16-18 years. Optimal nutritional status conditions have not been achieved because nutritional problems such as undernutrition, overnutrition, and obesity are still common, including in Indonesia [5]–[8].

Nutrition affects growth and development so it will have a negative impact on national development if it is not fulfilled properly. Malnutrition has a negative impact on growth, physical health, cognitive,

behavior and mood and changes in other body functions [9], [10]. The influence of anxiety on nutritional status of adolescents during the COVID-19 pandemic needs to be investigated. This study is to analyze the nutritional and psychological well-being of adolescents during the COVID-19 pandemic.

2. RESEARCH METHOD

The cross-sectional study. The sampling was done by using incidental sampling. Both boys and girls aged 14-18 years have good communication skills, and are willing to be research subjects became the inclusion criteria. The independent variable of this research is nutritional status, while the determining variable is the psychological aspect (anxiety score).

2.1. Research instruments

The questionnaires were used to collect data on age, gender, and anxiety level. self-rating anxiety scale (SAS/SRAS) was used to assess anxiety level. The subjects were examined for their weight and height. Body weight and height were measured using a scale and height meter (Smic Sella). The body mass index (BMI) was computed by dividing weight (kg) by the square of height (m). The subjects then filled out the SAS/SRAS questionnaire to assess anxiety. The evaluation range is 20-80, with groups namely, scores 20-44 (mild anxiety), 45-59 (moderate anxiety), 60-74 (severe anxiety), and 75-80 (panic anxiety).

2.2. Data analysis

The data were analyzed descriptively to determine the percentage frequency, average, and standard deviation of the data that had been obtained. Furthermore, Spearman's bivariate correlation test was carried out.

3. RESULTS AND DISCUSSION

3.1. Results

The subjects were 154 adolescent boys and girls. Age range 14-18 years, weight between 36-120 kg, height between 146-182 cm, and BMI between 15.5-22.86. The highest BMI is 39.58, and the lowest is 15.5. A BMI of 39.58 is included in the category of obesity class II. A BMI of 15.5 was included in the category of severely underweight, and underweight, as shown in Table 1.

Table 2 showed that the mean anxiety score was 30.7. The average range of anxiety scores is included in the category of mild anxiety. Four people are included in the category of moderate anxiety. The rest are included in the type of mild anxiety. The analytical findings indicated no statistically significant correlation between anxiety and BMI ($p = 0.741$).

Table 1. Characteristics of research subjects

Data	Minimum	Maximum	Mean ± SD
Age (years)	14	18	15.78 ± 1.69
Body weight (kg)	36	120	58.69 ±14.41
Height (cm)	146	182	159.84 ± 6.64
BMI	15.5	39.58	22.86 ± 4.77

Table 2. Anxiety score

Data	Minimum	Maximum	Mean±SD
Anxiety score	20	56	30.7±6.73

3.2. Discussion

This study indicated that the nutritional status of research subjects is included in the category of obesity II class and severe thinness, and underweight nutrition. Similar research conducted by Maehara *et al.* and Larson *et al.* [6], [11] showed that 8.7% of adolescents aged 13-15 years and 8.1% of adolescents aged 20 were classified as thin or very thin. The prevalence of overweight and obesity was 16% among adolescents aged 13-15 years and 13.5% among those aged 16-18 years.

The condition of optimal nutritional status has not been achieved because nutritional problems such as undernutrition, overnutrition, and obesity are still common, including in Indonesia. Malnutrition is still an important health problem. The double burden of malnutrition (DBM) has become a global concern. Malnutrition including undernutrition and overnutrition (overweight and obesity) is an important health problem in Indonesia [6], [11]–[13].

This study shows that the average anxiety score is 30.7, which is included in the category of mild anxiety. Four people are included in the category of moderate anxiety, and the rest are included in the type of

mild anxiety. Several studies have shown that anxiety disorders are mental disorders that often occur in children and adolescents [14]–[16].

The findings of this study demonstrate that there is no statistically significant relationship between anxiety and nutritional status. Several similar studies have shown various results [17]–[19]. Some people have different copings in dealing with stress such as increased appetite and frequent snacking, but there are also those who do the opposite. Many factors affect appetite and eating patterns [13], [20], [21]. COVID-19 affects various aspects of life, including nutritional status and psychological aspects of adolescents [5], [22]–[24].

Nutritional status is a description of the health condition of both individuals and groups which is determined by the physical need for energy and other nutrients obtained from food and food sources that have an impact on their physical and can be measured anthropometrically. Nutritional status can be categorized as optimal if the intake of nutrients with nutritional needs is balanced. Nutritional status is a person's nutritional status expressed according to the type and severity of malnutrition, which occurs due to various factors that influence each other [25]–[28].

Nutritional status is a factor that exists at the individual level, a factor that is directly influenced by the amount and type of food intake and infectious conditions. The physical state of an individual or group is characterized by one or a combination of specific dietary metrics. Malnutrition has the meaning of a pathological condition in which the body has an excess or lack of nutrition in relative or absolute terms. Hunger and malnutrition are still major health problems in all poor developing countries. In the world, nutritional problems include inadequate intake relative to demand and infections as well as excessive food intake. In developing and poor countries, the problem is around lack of intake, causing nutritional deficiencies such as protein-energy deficiency, anemia, iodine deficiency, and other micronutrient deficiencies. Data on weight for age and about 230 were stunted in terms of height for age. Malnutrition in children and adolescents affects growth and development and potential and has a negative impact on national development. Malnutrition has a negative impact on growth, physical health, cognitive, behavior, and mood as well as changes in other body functions [10], [29]–[31].

The COVID-19 pandemic affects several facets of existence. Numerous families have seen a decline in household income, rendering them less capable of purchasing good and nutritious meals for their children. Failure to promptly enhance preventative and treatment services for children facing nutritional issues may result in a rise in childhood diseases and fatalities associated with these conditions. Immediate measures to avert and mitigate child nutrition issues encompass enhancing evidence-based preventive strategies, ensuring high-quality data and information on nutrition, and augmenting access to locally sourced vital commodities for better nutritional outcomes. Nutrition services for at-risk children and families, encompassing growth monitoring, micronutrient delivery, maternal assistance for proper baby and young child feeding, and screening and treatment for malnutrition in children and adolescents.

4. CONCLUSION

The nutritional status and anxiety of adolescents during the COVID-19 pandemic in this study had no statistical relationship. Although, previous studies have shown a relationship between anxiety and malnutrition, this study did not show a relationship. This may be due to confounding factors that need to be studied further. Nutrition affects growth and development. Malnutrition has a negative impact on growth, physical health, psychological health, cognitive, behavior, and mood as well as changes in other bodily functions.

ETHICAL APPROVAL

This research has received permission from the Medical and Health Sciences Ethics Committee, Universitas Muhammadiyah Yogyakarta (approval number: KE/FKIK/254/EC/2022).

REFERENCES

[1] S. Naveed, T. Lakka, and E. A. Haapala, "An overview on the associations between health behaviors and brain health in children and adolescents with special reference to diet quality," *International Journal of Environmental Research and Public Health*, vol. 17, no. 3, p. 953, Feb. 2020, doi: 10.3390/ijerph17030953.

[2] S. P. Adhikari *et al.*, "A scoping review of 2019 Novel Coronavirus during the early outbreak period: Epidemiology, causes, clinical manifestation and diagnosis, prevention and control," *Preprint, Research Square*, pp. 1–12, 2020, doi: 10.21203/rs.2.24474/v1.

[3] Z. Wu and J. M. McGoogan, "Characteristics of and important lessons from the Coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese center for disease control and prevention," *JAMA - Journal of the American Medical Association*, vol. 323, no. 13, pp. 1239–1242, 2020, doi: 10.1001/jama.2020.2648.

[4] M. Omiwole, C. Richardson, P. Huniewicz, E. Dettmer, and G. Paslakis, "Review of mindfulness-related interventions to modify eating behaviors in adolescents," *Nutrients*, vol. 11, no. 12, pp. 1–16, 2019, doi: 10.3390/nu11122917.

[5] R. Indriawati and T. Wibowo, "The pattern of internet use during the COVID-19 pandemic in the 18-24 Years age departement of pediatric, Faculty of Medicine Public Health and Nursing, Universitas Key Messages," *Annals of Tropical Medicine & Public*

Health, vol. 24, no. 01, 2021.
[6] M. Maehara, J. H. Rah, A. Roshita, J. Suryantan, A. Rachmadewi, and D. Izwardy, "Patterns and risk factors of double burden of malnutrition among adolescent girls and boys in Indonesia," *PLoS ONE*, vol. 14, no. 8, pp. 15–18, 2019, doi: 10.1371/journal.pone.0221273.
[7] E. Jalo *et al.*, "Emotional eating, health behaviours, and obesity in children: A 12-country cross-sectional study," *Nutrients*, vol. 11, no. 2, pp. 1–17, 2019, doi: 10.3390/nu11020351.
[8] T. Hidayati, M. Suen, and R. Indriawati, "Diet , physical activity and obesity incidence in adolescents with disabilities," *Journal of Medical and Healthcare Development*, vol. 12, no. 1, pp. 588–594, 2023, doi: 10.15562/bmj.v12i1.3778.
[9] C. Serón-Arbeloa *et al.*, "Malnutrition screening and assessment," *Nutrients*, vol. 14, no. 12, pp. 1–30, 2022, doi: 10.3390/nu14122392.
[10] P. Christian and E. . Smith, "Adolescent undernutrition: global burden, physiology, and nutritional risks," *Annals of Nutrition and Metabolism*, vol. 72, no. 4, 2018, doi: 10.1159/000488865.
[11] L. M. Larson, R. Martorell, and P. J. Bauer, "A path analysis of nutrition, stimulation, and child development among young children in Bihar, India," *Child Development*, vol. 89, no. 5, pp. 1871–1886, 2018, doi: 10.1111/cdev.13057.
[12] R. Indriawati, M. R. Azis, and U. M. Yogyakarta, "Simple nutrition screening tool (SNST) in nutritional assessment as a risk factor for cardiovascular disease in the elderly," *Jurnal Profesi Medika : Jurnal Kedokteran dan Kesehatan*, vol. 15, no. 2, 2021.
[13] V. Andini and R. Indriawati, "The correlation between dietary habit with attention and body fatigue in adolescent (in Bahasa: *Hubungan Pola Makan dengan Atensi dan Kelelahan Tubuh pada Kelompok Umur Remaja*)," *2-TRIK: Tunas-Tunas Riset Kesehatan*, vol. 11, no. 5, pp. 104–108, 2021, doi: 10.33846/2trik11208.
[14] S. Doering *et al.*, "Childhood-onset versus adolescent-onset anxiety and depression: Epidemiological and neurodevelopmental aspects," *Psychiatry Research*, vol. 312, no. July 2021, 2022, doi: 10.1016/j.psychres.2022.114556.
[15] E. Lakasing and Z. Mirza, "Anxiety and depression in young adults and adolescents," *British Journal of General Practice*, vol. 70, no. 691, pp. 56–57, 2020, doi: 10.3399/bjgp20X707765.
[16] Z. Song, J. Huang, T. Qiao, J. Yan, X. Zhang, and D. Lu, "Association between maternal anxiety and children's problem behaviors: a systematic review and meta-analysis," *International Journal of Environmental Research and Public Health*, vol. 19, no. 17, 2022, doi: 10.3390/ijerph191711106.
[17] A. Pleplé *et al.*, "Nutritional status and anxious and depressive symptoms in anorexia nervosa: a prospective study," *Scientific Reports*, vol. 11, no. 1, pp. 1–12, 2021, doi: 10.1038/s41598-020-79410-y.
[18] M. Gholizadeh, L. Setayesh, H. Yarizadeh, A. Mirzababaei, C. C. T. Clark, and K. Mirzaei, "Relationship between the double burden of malnutrition and mental health in overweight and obese adult women," *Journal of Nutritional Science*, vol. 11, pp. 1–7, 2022, doi: 10.1017/jns.2022.7.
[19] H. Coulthard, M. Sharps, L. Cunliffe, and A. Van Den Tol, "Eating in the lockdown during the COVID-19 pandemic; self-reported changes in eating behaviour, and associations with BMI, eating style, coping and health anxiety," *Appetite*, no. January, 2020.
[20] I. Becetti *et al.*, "The neurobiology of eating behavior in obesity: Mechanisms and therapeutic targets: A report from the 23rd annual harvard nutrition obesity symposium," *American Journal of Clinical Nutrition*, vol. 118, no. 1, 2023, doi: 10.1016/j.ajcnut.2023.05.003.
[21] I. C. Alcantara, A. P. M. Tapia, Y. Aponte, and M. J. Krashes, "Acts of appetite: neural circuits governing the appetitive, consummatory, and terminating phases of feeding," *Nature Metabolism*, vol. 4, no. 7, pp. 836–847, 2022, doi: 10.1038/s42255-022-00611-y.
[22] C. González-Monroy, I. Gómez-Gómez, C. M. Olarte-Sánchez, and E. Motrico, "Eating behaviour changes during the COVID-19 pandemic: A systematic review of longitudinal studies," *International Journal of Environmental Research and Public Health*, vol. 18, no. 21, 2021, doi: 10.3390/ijerph182111130.
[23] A. Fiorillo and P. Gorwood, "The consequences of the COVID-19 pandemic on mental health and implications for clinical practice," *European Psychiatry*, vol. 63, no. 1, 2020, doi: 10.1192/j.eurpsy.2020.35.
[24] T. Nikolic Turnic *et al.*, "Post-COVID-19 status and its physical, nutritional, psychological, and social effects in working-age adults—a prospective questionnaire study," *Journal of Clinical Medicine*, vol. 11, no. 22, 2022, doi: 10.3390/jcm11226668.
[25] A. L. Tardy, E. Pouteau, D. Marquez, C. Yilmaz, and A. Scholey, "Vitamins and minerals for energy, fatigue and cognition: A narrative review of the biochemical and clinical evidence," *Nutrients*, vol. 12, no. 1, 2020, doi: 10.3390/nu12010228.
[26] R. Indriawati and S. Syaifudin, "Relationship between demographic factors and body mass index with the prevention of hypertension in adolescents," *Journal of Health Promotion and Behavior*, vol. 5, no. 2, pp. 72–78, 2020, doi: 10.26911/thejhpb.2020.05.02.01.
[27] D. Choudhuri and S. Balaram, "Factors associated with nutritional status of adolescent schoolchildren in Tripura," *Indian Pediatrics*, vol. 57, no. 2, pp. 177–178, 2020, doi: 10.1007/s13312-020-1740-y.
[28] A. I. Daniel *et al.*, "Pathways between caregiver body mass index, the home environment, child nutritional status, and development in children with severe acute malnutrition in Malawi," *PLoS ONE*, vol. 16, no. 8 August, pp. 1–15, 2021, doi: 10.1371/journal.pone.0255967.
[29] T. Wibowo *et al.*, "Maternal and neonatal factors affecting bone mineral content of indonesian term newborns," *Frontiers in Pediatrics*, vol. 9, no. May, pp. 1–7, 2021, doi: 10.3389/fped.2021.680869.
[30] R. Indriawati and E. Y. Trisna, "The macronutrients essence intake and learning achievements in adolescent 16-18 years old," *European Journal of Humanities and Educational Advancements (EJHEA)*, vol. 3, no. 03, pp. 96–100, 2022.
[31] U. Fahmida *et al.*, "Effect of an integrated package of nutrition behavior change interventions on infant and young child feeding practices and child growth from birth to 18 months: Cohort evaluation of the baduta cluster randomized controlled trial in east Java, Indonesia," *Nutrients*, vol. 12, no. 12, pp. 1–16, 2020, doi: 10.3390/nu12123851.

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