



Assessment of Diet Diversity among College Students at STIKes Mitra Keluarga

Arindah Nur Sartika

Sekolah Tinggi Ilmu Kesehatan, Bekasi, Indonesia

*Correspondence: E-mail: arindahns@stikesmitrakeluarga.ac.id

ABSTRACT

Background: Students in health college are addressed to have healthy lifestyle, such as having good food habit. Good food habit can be shaped from consuming variety of food. Varied food can prevent nutrient deficiency, one of them is anemia that suffered by one-third women in Indonesia. This study aims to assess diet diversity among college students at STIKes Mitra Keluarga.

Research Methods: This study is cross sectional study. About 225 respondents join the study, give information about what their eat during 24 hours, twice, with questionnaire from Minimum Dietary Diversity for Women (MDD-W). The formular consists of 14 food groups and 4 additional groups.

Research Result: The results show 9.4% students with score <5 out of 14. The highest score is 13, and the lowest is 2. The biggest proportion is staple food group, followed by green leafy vegetable group, egg group, and dairy product. Hal of students consumed salty snack and fried snack also sweets. Around 71.9 respondents have habit to consume supplements such as vitamin C, multivitamin, and multimineral.

Conclusion: Based on the study, it concludes that some students already have diverse dietary habit, but there are still some students consume not many types of food, include consuming empty calorie food.

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1. INTRODUCTION

Anemia is one of the nutritional problems faced by various age groups in Indonesia. One of the age groups experiencing an increase in the prevalence of anemia is adolescents and young adults (15-24 years). Based on Riskesdas 2007, 6.9% of teenagers and young adults experienced anemia, increased to 18.4% in 2013, and 32% in 2018 (Kemenkes, 2018).

If the problem of malnutrition is not treated, it can continue to occur in the next phase of life, namely women reproductive-aged and pregnant women. Especially for pregnant women, micronutrient deficiency conditions can increase the risk of problems during childbirth such as low birth weight. Anemia in Indonesia can occur due to chronic energy deficiency and micronutrient deficiencies. Consuming balanced nutrition from various food groups can prevent micronutrient deficiencies including anemia (Farag MA *et al*, 2021; Lipoeto NI, Masrul & Nindrea RD, 2020).

Several studies have assessed the diversity of food consumption in women of childbearing age and adolescents using the minimum dietary diversity for women (MDD-W). In a study conducted in Thailand among the reproductive age group, it was found that there were still women who only consumed 2 types of food groups in one day (Puwanant M *et al*, 2022). Meanwhile, similar research conducted in Indonesia, which specifically focused on women of childbearing age who were at risk of experiencing chronic malnutrition, found that the lowest score was 3 and a total of 8 food group assessments (Ayu W *et al*, 2023). This means that there are still respondents who consume less diverse foods in one day. This also contradicts with one of the principles of balanced nutrition established by the Government of the Republic of Indonesia, namely consuming a variety of foods (Kemenkes, 2014). This can be a concern if it happens to students, especially female students, because they belong to women of childbearing age who will later become pregnant women. Another study stated that the diversity of food consumption assessed with a similar instrument was related to anemia in pregnant women.

Based on this background, researchers conducted research aimed at assessing the diversity of food consumption among students at STIKes Mitra Keluarga. The consideration in choosing the location is because health students are prospective health workers who should have a good diet. The majority of students at these locations are also women and include teenagers and young adults as well as women of childbearing age.

2. METHODS

This research was an observational study with a cross-sectional study design. The research design had received ethical review permission from the Binawan University Health Research Ethics Committee with No. 029/PE/FKK-KEPK/IX/2021. A total of 224 STIKes Mitra Keluarga students participated in the research.

Respondents completed 24-hour food consumption data two times. Food consumption was measured using the Minimum Dietary Diversity for Women (MDD-W) questionnaire. The form consists of 14 food groups and 4 additional questions. If the respondent consumes a certain food group, they are given a score of 1. A score of 1 is given if the food consumption is at least 1 tablespoon (15 g). The scores are then totaled with a maximum score of 10. Total scores were classified into two groups : diverse (≥ 5) and not diverse (<5).

Components of food group: 1. Staple foods, 2. Legumes, 3. Nuts, 4. Milk and dairy products, 5. Meat, fish, and poultry, 6. Eggs, 7. Green leafy vegetables, 8. Fruits and vegetables rich in vitamin A, 9. Other vegetables, and 10. Other fruits. Additional questions are aimed at looking on eating habits that should be avoided/limited: 1. Sweet drinks, 2.

Snacks salty and fried foods, and 3. Sweet snacks. Apart from these three question items, questions were also asked about supplement consumption. The research results were processed using SPSS and presented in descriptive form.

3. RESULTS AND DISCUSSION

Table 1. Characteristics of respondents

Variable	N (223)	%
Study program		
Pharmacy	33	14.7
Nursing	36	16.1
Nutrition	115	51.3
Medical laboratory technology	30	13.4
Nursing (diploma)	10	4.5
Age group		
17 - 19	60	26.9
20 – 22	125	56.1
23 – 25	11	4.9
Prefer not to answer	27	12.1

Based on the research results, it is known that the majority of respondents consume a variety of foods in one day. This result showed better result than previous study with same instruments (Kumar A *et al*, 2020). In that study, the good diversity group was only 28.5%. Study from Syifa (2022) also showed mean score of diet diversity was 5.57 (Syifa NH, Briawan D & Kustiyal L, 2022). Other study by Kumar *et al* (2020) had similar result, mean score was 3.4. In this study, mean score was 7.19 and median score was 8. Higher score showed in the study might relate to different study background among students. Students might get more health knowledge and apply it during daily life style and diet. Poor dietary diversity was related to nutrition knowledge. Health campus environment probably also contribute to knowledge transfer (Endalifer ML *et al*, 2021).

This study obtained majority of students have good diet, but there was still students consumed poor diet. Students who ate less diverse food might have higher risk to be undernourished, or suffer from health problem. The lowest score in this study was 2. Explanation from UNICEF showed that less diverse diets might be related to economic condition that not assessed in this study (UNICEF, 2023). Although students in this study from health background, other determinants might influence their eating behaviour. There were individual factors such as food preferences, asceticism, time, and convenience. Social life (parental control, friends and peers) and physical environment (availability and accessibility, appeal and prices of food products) also contribute to eating behaviour. Students also might be influenced by macro environment such as media and advertising (Deliens T *et al*, 2014).

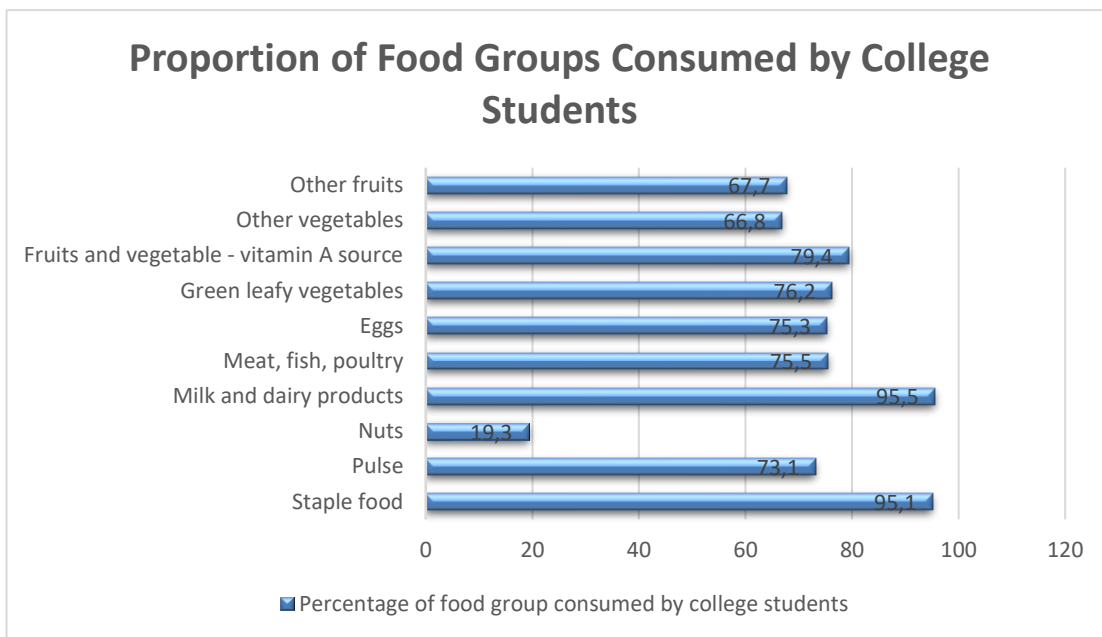


Figure 1. Percentage of food group consumed by college students

The study program with the highest percentage of students eat diverse food was pharmacy. The food groups most consumed by all participants were 1) meat, poultry and fish; 2) staple foods, both showed almost same percentage. Meat, poultry and fish were animal protein source foods that good in balanced diet since it consists of essential amino acid (Kemenkes, 2014). Meat also contain high heme iron level. Meat groups assessed in this study include beef and organ meats. Beef was considered as highest heme iron (1.06–2.63 mg per 100 g), followed by pork (0.30–0.61 mg per 100 g), fish (0.46 mg per 100 g), and chicken (0.17–0.49 mg per 100 g). Dietary source of heme iron can prevent anemia (Ahmad S *et al*, 2022). However to optimize iron supply, cooking methods and temperature should be considered. Study from Gandemer *et al* (2020) found that short durations and low heating temperatures showed almost no effect on the iron supply. The lowest contribution of meat to iron supply was during cooking with under-pressure and temperatures above 100°C (Gandemer G *et al*, 2020).

The group that is least consumed was nuts. Most consumed nut was peanut. This result was similar with study from Jember University with IIED. Nuts consumption was low, and peanuts was the most preferable nuts (Rohmawati N *et al*, 2019). Half of the research sample has the habit of consuming snacks in the form of salty and fried foods, sweet foods and sweet drinks. The results had similarity with previous studies. Sugar sweetened beverages and sugary foods were being the most favorite snacks among adolescents and young adults (Kontecki JE, 2014; Yuningrum H *et al*, 2014; Kontecki JE, 2014). Those unhealthy habits increase the risk of non-communicable disease (Kontecki JE, 2014). Moreover, these foods are low in micronutrients, so that classified as empty calorie food (Kontecki JE, 2014).

This research was conducted during the Covid-19 pandemic, based on supplement consumption it was found that more than two-thirds of the sample consumed supplements. This finding proved that dietary supplements consumption increament during Covid-18 pandemic among students, and it was identical with other studies from Almegwly *et al* (2022) in Saudi Arabia and Ningsih *et al* (2021) in Indonesia. From previous study also known that some motives to consume supplements among college are to promote health, provide extra energy, add muscle strength, and support performance (Lieberman HR *et al*, 2015).

Table 2. Diet Diversity of College Students in STIKes Mitra Keluarga

Variable	n	%
Diet diversity score		
2	2	0.9
3	8	3.6
4	12	5.4
5	28	12.6
6	27	12.1
7	31	13.9
8	44	19.7
9	52	23.3
10	19	8.5
Diet diversity classification		
Diverse (<5 food group)	201	90.1
Not diverse (≥ 5 food group)	22	9.9

4. CONCLUSION

Based on the study, it concludes that some students already have diverse dietary habit, but there are still some students consume not many types of food, include consuming empty calorie food. Students are recommended to improve variety of food consumption, and limit intake on sugar sweet beverages and fatty foods. Future study are suggested to assess relationship of dietary diversity and nutritional problems in women reproductive age, also its determinants.

5. REFERENCES

1. Kementerian Kesehatan Republik Indonesia. (2018). *Laporan Nasional Riset Kesehatan Dasar 2018*. Jakarta: Kementerian Kesehatan Republik Indonesia
2. Farag, M. A. *et al.* (2021). Dietary micronutrients from zygote to senility: Updated review of minerals' role and orchestration in human nutrition throughout life cycle with sex differences. *Nutrients*, 13(11), 3740.
3. Lipoeto, N. I., Masrul & Nindrea, R. D. (2020). Nutritional contributors to maternal anemia in Indonesia: Chronic energy deficiency and micronutrients. *Asia Pac. J. Clin. Nutr.* 29, 9–17.
4. Puwanant, M., Boonrusmee, S., Jaruratanasirikul, S., Chimrung, K. & Sriplung, H. (2022). Dietary diversity and micronutrient adequacy among women of reproductive age: a cross-sectional study in Southern Thailand. *BMC Nutr.* 8, 1–11.
5. Ayu, W. *et al.* (2023). Minimum dietary diversity women (MDDW) pada wanita usia subur. *Current Developments in Nutrition*, 15, 17–25.
6. Kementerian Kesehatan Republik Indonesia. (2014). *Peraturan Menteri Kesehatan no. 41 tentang Pedoman Gizi Seimbang*. Jakarta: Kementerian Kesehatan Republik Indonesia.
7. Kumar, A. *et al.* (2020). Assessment of diet diversity and eating pattern of undergraduate students: A pan India study. *Int. J. Med. Public Heal.* 10, 58–63.
8. Syifa, N. H., Briawan, D. & Kustiyah, L. (2022). Pengetahuan gizi dan kesehatan, keragaman pangan serta aktivitas fisik mahasiswa Gizi IPB selama masa pandemi covid-19. *J. Ilmu Gizi dan Diet*, 1, 103–109.
9. Endalifer, M. L., Andargie, G., Mohammed, B. & Endalifer, B. L. (2021). Factors associated

- with dietary diversity among adolescents in Woldia, Northeast Ethiopia. *BMC Nutr.* 7, 1–8.
10. UNICEF. (2023). *Undernourished and Overlooked: A Global Nutrition Crisis in Adolescent Girls and Women*. <https://www.unicef.org/reports/undernourished-overlooked-nutrition-crisis>.
 11. Deliens, T., Clarys, P., Bourdeaudhuij, I. De & Deforche, B. (2014). Determinants of eating behaviour in university students : a qualitative study using focus group discussions. *BMC Public Health*, 14(53), 1–12.
 12. Ahmad, S., Nasir, M., Mushtaq, Z. & Khan, R. S. (2022). Evaluating the effect of animal-based iron sources on iron deficiency anemia. *Pakistan Biomed. J.* 3, 29–33.
 13. Gandemer, G., Scislawski, V., Portanguen, S. & Kondjoyan, A. (2020). The impact of cooking of beef on the supply of heme and non-heme iron for humans. *Food Nutr. Sci*, 11, 629–648.
 14. Rohmawati, N. et al. (2019). *Indonesia ' s triple burden of malnutrition A call for urgent policy change*. <https://www.iied.org/16662iied#:~:text=With%20micronutrient%20deficiencies%20added%20to,childhood%20chronic%20undernutrition%20and%20overweight>.
 15. Kotecki, J. E. (2014). Hubungan konsumsi fast food, makanan/minuman manis dan aktifitas fisik dengan kadar gula darah dan status gizi mahasiswa Fakultas Kedokteran Universitas Sam Ratulangi. *Journal of Public Health and Community Medicine*, 14.
 16. Yuningrum, H., Rahmuniyati, M. E. & Lende, T. D. P. (2014). konsumsi gorengan dan asupan kolesterol berhubungan dengan kejadian hiperkolesterolemia pada mahasiswa. *Jurnal Kesehatan Masyarakat Khatulistiwa, Universitas Respati Yogyakarta. Kesehatan Masyarakat Khatulistiwa*, 9.
 17. Kotecki, J. E. (2014). Snacking patterns throughout the life span: potential implications on health. *Nutrition Research*, 91.
 18. Kotecki, J. E. *Physical Activity & Health 4th Edition*. (Jones & Bartlett Learning, 2014).
 19. Almegewly, W. H. et al. (2022). Perceptions and patterns of dietary supplements' use during covid-19 among undergraduate female students in Saudi Arabia. *Nutrients*, 14.
 20. Ningsih, W. I. F., Yuniyanto, A. E., Atmaka, D. R., Arinda, D. F. & Fajrina, H. (2021). Gambaran konsumsi suplemen dan herbal pada mahasiswa sebelum dan selama pandemi covid-19 overview of supplements and herbs consumption among college students before and during the covid-19 pandemic. *J. Pangan Kesehat. Gizi*, 1, 1–8.
 21. Lieberman, H. R. et al. (2015). Patterns of dietary supplement use among college students. *Clin. Nutr.* 34, 976–985.