

## DOES EATING OUT CAUSE IN OVERWEIGHT AND OBESITY IN ADOLESCENCE?

**Reny Rahmawati<sup>1\*</sup>, Ida Nurwati<sup>2</sup>, Budiyantri Wiboworini<sup>1</sup>**

<sup>1</sup>Nutrition Science Department, Postgraduate Program, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Surakarta, Central Java 57126, Indonesia

<sup>2</sup>Biochemistry Department, Medical Faculty, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Surakarta, Central Java 57126, Indonesia

\*[renyrahmawati@student.uns.ac.id](mailto:renyrahmawati@student.uns.ac.id)

### ABSTRACT

Overweight and obesity, among others, arise from not choosing food intake properly. It was triggered by a shift in people-trend which prefer to buy food outside than at home, mainly during college period. Student food choices that are characterized by high energy, fat, salt, and low fiber can impact on fat accumulation and overweight. The study aimed to explore the association between eating out with overweight and obesity among college student at Sebelas Maret University, Surakarta. This study used a cross-sectional design. As many as 206 respondents were taken using convenience sampling. Data was collected through Google Forms, height and weight were measured based on independent reports and presented descriptively. The relationship between eating out habits and obesity was analyzed using Chi Square. The prevalence of overweight and obesity among college students was 11.2% and 52.4%, respectively. There was a relationship between eating out habits purchased directly with overweight and obesity in Sebelas Maret University students ( $p < 0,047$ ). Eating out can increase the risk of overweight/obesity in college students. It is necessary to pay attention to the selection of types of food consumed by students outside the home.

Keywords: college student; eating out; obesity; overweight

### INTRODUCTION

The increasing incidence of overweight and obesity among adolescents has become a health problem that cannot be ignored (WHO, 2021). According to the 2018 Basic Health Research (Riskesdas), the prevalence of overweight and obesity in Indonesia has reached 13.6% and 21.8% with a type of central obesity of 31% (Riskesdas, 2018). People now seek easy and quick consuming patterns due to advances in digital technology and lifestyle changes (Cha and Seo, 2020). Eating out activities have become part of a lifestyle that has caused a shift in the culture of eating at home (Fajarni, 2019). This eating practice has threatening negative repercussions, one of which is the impact on the nutritional status of obese and overweight people (Ma *et al.*, 2021).

Eating out is defined as consuming food or drinks outside the home or buying food made outside the home which is then consumed at home or dine in (Puspitasari, 2020). Recent research in developed and developing countries shows the proportion of individuals eating out reaches 50% (Mognard *et al.*, 2023). This percentage increase has serious ramifications that should not be overlooked. Such as online meal delivery services enable 'online' access to food establishments. It provides consumers with comfort and convenience (Keeble *et al.*, 2021). Eating habits and patterns are significant determinants of overweight/obesity. Excessive eating frequency or portion size is linked to the prevalence of obesity (Banjarnahor *et al.*, 2021). The increase in the incidence of obesity in college students is triggered by unhealthy eating habits that can have a negative impact on weight status in young adults (Sogari *et al.*, 2018). College students are the population most at risk of experiencing weight gain associated with decreased food quality (Nurkhopipah *et al.*, 2018). Supply of energy from unhealthy foods and ignoring healthy foods rich in fruits and vegetables

contributes towards obesity. This change is thought to have the effect of increasing the incidence of overweight (Al-Jawaldeh and Abbass, 2022).

Previous cross-sectional research have looked at how buying meals from somewhere else (take-out food) affects weight gain and the causes of obesity in college students. This is caused by the food's content. desire for foods heavy in fat and sugar (HFHS) (Jiang *et al.*, 2019). This tendency is not restricted to the repercussions of obesity and weight increase. However, many problems such as metabolic, cardiovascular, and degenerative disorders linked to other bad eating behaviors lurk behind this influence (Przybyłowicz and Danielewicz, 2022). There are not too many studies in Surakarta related to "eating out" eating patterns, so research is needed that focuses on the relationship between eating out and obesity among students. This observational study was carried out in light of the harmful impact of eating out. The study aimed to explore the association between eating out with overweight and obesity among college student at Sebelas Maret University, Surakarta

## METHOD

This study used descriptive associated with a cross-sectional study design. The population was undergraduate and postgraduate students of 10 faculties in Sebelas Maret University was conducted in March 2023. Samples were recruited using convenience sampling; 206 college students were involved as respondents. Inclusion criteria are Sebelas Maret University students willing to be a respondent and filling out a research questionnaire via Google form. The independent variable is the intensity of eating out purchased directly and/or online food delivery. The dependent variable is the nutritional status. The research instrument was a questionnaire containing demographic data, height, weight measured based on independent reports, and intensity of eating out purchased directly and/or online food ordering. The univariate analysis described the frequency distribution of the sample's gender, age, place of residence, intensity, and Body Mass Index (BMI). Bivariate analyses used the chi-square test

## RESULTS AND DISCUSSION

Table 1.  
Characteristics of Respondent (n=206)

Characteristics	f	%
Gender		
Male	63	30,6
Female	143	69,4
Age (years old)		
17-20	98	47,6
21-25	95	46,1
>25	13	6,3
Place of Residence		
Indekost/Rent house	163	79,1
Parents/family house	43	20,9

Table 1 shows the distribution of characteristic respondents majority gender female exist 143 respondents (69,4%), aged 17-20 years exist 98 respondents (47,6%), majority place of respondent are indekost/rent house exist 163 respondents (79,1%) based on the demographic characteristics of

206 students. Students who live in boarding houses usually tend to choose foods that are easy to process, practical and fast (Widyastuti, 2017).

Table 2.  
 Frequency Distribution of Respondent's BMI (n=206)

Characteristics	f	%
Overweight/Obesity	131	63,6
Non Overweight/Obesity	75	36,4

Table 2 most of respondents have nutrition status overweight/obesity exist 131 respondents (63,6%) consist of overweight 23 respondents (11,2%) and obesity 108 respondents (52,4%). While non overweight/obesity exist 75 respondents (36,4%) consist of normal 56 respondents (27,2%) and underweight 19 respondents (9,2%).

Table 3.  
 Frequency Distribution of Eating Out (n=206)

Characteristics	f	%
Purchased Directly		
Rarely	40	19,4
Often	166	80,6
Purchased by Online Food Delivery		
Rarely	150	72,8
Often	56	27,2

Table 3 shows that 166 respondents (80,6%) in Sebelas Maret University often eating out which is purchased directly, while students who rarely eating out are 40 respondents (19,4%). Meanwhile 150 respondents (72,8%) rarely eating out which is purchased by online food delivery, while students who often eating out are 56 respondents (27,2%).

Table 4.  
 Relationship Between Eating Out and Overweight/Obesity (n=206)

Characteristics	Obesity				Total		Value-P
	Non Overweight/ Obesity		Overweight/ Obesity				
	f	%	f	%	f	%	
Purchased Directly	20	14,6	20	25,4	40	19,4	0,047
Rarely	55	26,7	111	53,9	166	80,6	
Often							
Purchased by Online Food Delivery							0,079
Rarely	60	29,1	90	43,7	150	72,8	
Often	15	7,3	41	19,9	56	27,2	

Table 4 the frequency distribution of the relationship between eating out purchased directly and incidence of overweight and obesity in students at Sebelas Maret University are 111 respondents (53,9%) who often eating out have overweight and obese. Meanwhile 20 respondents (14,6%) who rarely eating out have non overweight and obese. Eating out purchased directly is associated

between overweight and obesity with  $p$ -value= 0,047 using chi square test. Most respondents have intensity of eating out purchased by online food delivery and incidence of overweight and obesity with rarely category exist 90 respondents (43,7%), meanwhile not much different of 60 respondents (29,1%) who also rarely eating out purchased by online food delivery have non overweight and obesity. Despite the ease with which food can be obtained, both around and through delivery applications (Albalawi *et al.*, 2022). This study found that eating out purchased via online food delivery was not associated with being overweight/obese ( $p=0.079$ ).

This study found association between the intensity of eating out of purchased directly with college students' overweight and obesity. This cross-sectional finding is consistent with prior study that found eating out three times a week or more was statistically substantially associated with a higher prevalence of overweight and obesity in boys (Ma *et al.*, 2021). Furthermore, it is similar to previous study by (McClain *et al.*, 2018) that there are 37.2% of Latinos are overweight and 39.6% are obese and have a habit of eating out 5 times/week. According to Prabowo (2015), the cause of someone eating out can be influenced by several factors including no time to prepare food at home, easy access to restaurants, or promotions/discounts. This study is in line with the results of previous studies found that most reason why students buy food outside the home directly is because they don't have time to cook 49% and reasons ordered from online food delivery is because simple, fast and save time 31,1% and lots of promotions and discounts 30,1%. Although there is a link between eating out and obesity, we discovered no link between eating online and obesity.

This study also found that eating out purchased by online food delivery did not associated with overweight/obesity. It is comparable to earlier research that shows no association between knowledge and the intensity of online food ordering and no correlation between the power of online food ordering and nutritional status (Kurniawati *et al.*, 2021). According to that research most of the food ordered online is high in sugar, salt and fat. The absence of this association is reinforced by the fact that online food purchases will not be connected with obesity. Obesity is caused more by the type and amount of food consumed, especially high-fat, high-calorie, and energy-dense (Jiang *et al.*, 2019) The shift in trends in an increasingly modern society that prefers to buy food outside the home rather than consuming food cooked by yourself brings great opportunities to increase accessibility and availability of food, encouraging people, especially young people, to eat out more often (Maimaiti *et al.*, 2018). With the tremendous rise of the catering business in recent years, eating at restaurants has become more convenient. Youngsters have easy access to dine out or order online, which has likely contributed to an increase in the frequency of eating out among youngsters (Ma *et al.*, 2021).

Eating outside the home has contributed to increased intake of energy and higher fat and lower intake of micronutrients in adolescents and young adults (Lachat *et al.*, 2012). College period is a critical period for changing unhealthy eating behaviors (Deliens *et al.*, 2014). The selection of student food which is identical to the types of food high in energy, fat, salt and low in fiber can have an impact on fat accumulation (Rahman *et al.*, 2021). A recent scoping study found that dining out of the house regularly was connected with an increased chance of becoming overweight or obese food. Consumption away from home was linked to increased energy intake and lower diet quality (Landais *et al.*, 2022). Food and beverages consumed by students outside the home contribute 46.9% of total daily energy intake, with a higher composition of saturated fat intake (Llanaj *et al.*, 2018).

Although the underlying process is not clear, various factors may be responsible for this causal link. Including is the threat of unhealthy food containing a lot of energy from fast food and fatty foods (Landais *et al.*, 2022). Furthermore, a vast body of research has found that eating out is connected with a higher energy intake (Seguin *et al.*, 2016). Environmental factors around places of activity such as campuses, friends, and the availability of food through restaurants and homes also play a role in eating changes that lead to obesity in college students (Surjadi, 2013). However, students choose to consume it for taste and pleasure without any thought for their future health.

## CONCLUSION

There is a correlation between eating out habits purchased directly with overweight and obesity. Meanwhile, there is no correlation between eating out habits by online food delivery with overweight and obesity. Eating out activities among students are more often purchased directly than using online food delivery. Students must pay attention to the types of food consumed outside the home. Choosing healthier foods and reducing consumption of fast food is recommended to avoid the occurrence of various degenerative diseases and complications for those who are obese.

## REFERENCES

- Al-Jawaldeh A and Abbass MMS (2022). Unhealthy Dietary Habits and Obesity: The Major Risk Factors Beyond Non-Communicable Diseases in the Eastern Mediterranean Region. *Frontiers in Nutrition*, 9(March). doi: 10.3389/fnut.2022.817808.
- Albalawi AA, Hambly C and Speakman JR (2022). Consumption of Takeaway and Delivery Meals Is Associated with Increased BMI and Percent Fat among UK Biobank Participants. *The American Journal of Clinical Nutrition*, pp.: 173–188. doi: 10.1093/ajcn/nqac078.
- Banjarnahor RO, Banurea FF, Panjaitan JO, Pasaribu RSP and Hafni I (2021). Faktor-Faktor Risiko Penyebab Kelebihan Berat Badan Dan Obesitas Pada Anak Dan Remaja : Studi Literatur Risk Factors of Overweight and Obesity in Childhood and Adolescence : A Literature Review. *TROPHICO: Tropical Public Health Journal*, pp.: 35–45.
- Cha SS and Seo BK (2020). The Effect of Food Delivery Application on Customer Loyalty in Restaurant. *Journal of Distribution Science*, 18(4), pp.: 5–12. doi: 10.15722/jds.18.4.20204.5.
- Deliens T, Clarys P, De Bourdeaudhuij I and Deforche B (2014). Determinants of Eating Behaviour in University Students: A Qualitative Study Using Focus Group Discussions. *BMC Public Health*, 14(1), pp.: 1–12. doi: 10.1186/1471-2458-14-53.
- Fajarni S (2019). Eating Out Sebagai Gaya Hidup (Studi Kasus Fenomena Remaja Kota Banda Aceh Di Restoran Canai Mamak KL). *Aceh Anthropological Journal*, 3(1), pp.: 21. doi: 10.29103/aaj.v3i1.2784.
- Jiang Y, Wang J, Wu S, Li N, Wang Y, Liu J, Xu X, He Z, *et al.* (2019). Association between Take-out Food Consumption and Obesity among Chinese University Students: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, 16(6). doi: 10.3390/ijerph16061071.
- Keeble M, Adams J, Vanderlee L, Hammond D and Burgoine T (2021). Associations between Online Food Outlet Access and Online Food Delivery Service Use amongst Adults in the

- UK: A Cross-Sectional Analysis of Linked Data. *BMC Public Health*, 21(1), pp.: 1–12. doi: 10.1186/s12889-021-11953-9.
- Kurniawati ND, Cahyaningsih SN and Wahyudi AS (2021). The Correlation Between Online Food Ordering and Nutritional Status among College Students in Surabaya. *Indonesian Journal of Community Health Nursing*, 6(2), pp.: 70. doi: 10.20473/ijchn.v6i2.27520.
- Lachat C, Nago E, Verstraeten R, Roberfroid D, Van Camp J and Kolsteren P (2012). Eating out of Home and Its Association with Dietary Intake: A Systematic Review of the Evidence. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, 13(4), pp.: 329–346. doi: 10.1111/j.1467-789X.2011.00953.x.
- Landais E, Miotto-Plessis M, Bene C, Maitre d’Hotel E, Truong MT, Somé JW and Verger EO (2022). Consumption of Food Away from Home in Low- and Middle-Income Countries: A Systematic Scoping Review. *Nutrition Reviews*, 81(6), pp.: 727–754. doi: 10.1093/nutrit/nuac085.
- Llanaj E, Ádány R, Lachat C and D’Haese M (2018). Examining Food Intake and Eating out of Home Patterns among University Students. *PloS one*, 13(10), pp.: e0197874. doi: 10.1371/journal.pone.0197874.
- Ma Y, Gong W, Ding C, Song C, Yuan F, Fan J, Feng G, Chen Z, *et al.* (2021). The Association between Frequency of Eating out with Overweight and Obesity among Children Aged 6–17 in China: A National Cross-Sectional Study. *BMC Public Health*, 21(1), pp.: 4–11. doi: 10.1186/s12889-021-11104-0.
- Maimaiti M, Zhao X, Jia M, Ru Y and Zhu S (2018). How We Eat Determines What We Become: Opportunities and Challenges Brought by Food Delivery Industry in a Changing World in China. *European Journal of Clinical Nutrition* 2018 72:9, 72(9), pp.: 1282–1286. doi: 10.1038/s41430-018-0191-1.
- McClain AC, Ayala GX, Sotres-Alvarez D, Siega-Riz AM, Kaplan RC, Gellman MD, Gallo LC, Van Horn L, *et al.* (2018). Frequency of Intake and Type of Away-from- Home Foods Consumed Are Associated with Diet Quality in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). *The Journal of nutrition*, 148(3), pp.: 453–463. doi: 10.1093/jn/nxx067.
- Mognard E, Naidoo K, Laporte C, Tibère L, Alem Y, Khusun H, Februhartanty J, Niiyama Y, *et al.* (2023). ‘Eating Out’, Spatiality, Temporality and Sociality. A Database for China, Indonesia, Japan, Malaysia, Singapore and France. *Frontiers in Nutrition*, 10(11). doi: 10.3389/fnut.2023.1066737.
- Nurkhopipah A, Probandari AN and Anantanyu S (2018). Kebiasaan Makan, Aktivitas Fisik Dan Indeks Massa Tubuh (Imt) Mahasiswa S-1 Universitas Sebelas Maret Surakarta. *Jurnal Kesehatan Kusuma Husada*, pp.: 19–25. doi: 10.34035/jk.v9i1.342.
- Prabowo A (2015). Hubungan Frekuensi Makan Di Luar Rumah Dan Jumlah Uang Jajan Dengan Kejadian Gizi Lebih Pada Mahasiswi Di Surakarta. Available at: <https://digilib.uns.ac.id/dokumen/49850/Hubungan-Frekuensi-Makan-Di-Luar-Rumah-dan-Jumlah-Uang-Jajan-Dengan-Kejadian-Gizi-Lebih-Pada-Mahasiswi-Di-Surakarta> (Accessed: 22 August 2022).
- Przybyłowicz KE and Danielewicz A (2022). Eating Habits and Disease Risk Factors. *Nutrients*,

14(15), pp.: 5–8. doi: 10.3390/nu14153143.

- Puspitasari R (2020). *Hubungan Kebiasaan Makan Di Luar Rumah (Eating Out) Dengan Status Kegemukan Pada Individu Dewasa Di Kota Yogyakarta*. Universitas Gadjah Mada.
- Rahman MM, Salikunna NA, Wahyuni RD, Badaruddin R, Ramadhan MZ, Arief A, Fisiologi D, Kedokteran F, *et al.* (2021). Mahasiswa Fakultas Kedokteran Universitas Tadulako Angkatan 2019 Mahasiswa Kedokteran , Fakultas Kedokteran , Universitas Tadulako . Bagian Ilmu Gizi , Fakultas Kedokteran , Universitas Tadulako Depart. *Healthy Tadulako Journal ( Jurnal Kesehatan Tadulako )*, 7(1), pp.: 21–29.
- Riskesdas (2018). *Hasil Riset Kesehatan Dasar Tahun 2018*. Kementerian Kesehatan RI.
- Seguin RA, Aggarwal A, Vermeulen F and Drewnowski A (2016). Consumption Frequency of Foods Away from Home Linked with Higher Body Mass Index and Lower Fruit and Vegetable Intake among Adults: A Cross-Sectional Study. doi: 10.1155/2016/3074241.
- Sogari G, Velez-Argumedo C, Gómez MI and Mora C (2018). College Students and Eating Habits: A Study Using an Ecological Model for Healthy Behavior. *Nutrients*, 10(12), pp.: 1–16. doi: 10.3390/nu10121823.
- Surjadi C (2013). Globalisasi Dan Pola Makan Mahasiswa : Studi Kasus Di Jakarta BAKERY, 40(6), pp.: 416–421.
- WHO (2021). *Obesity and Overweight*. Available at: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>.
- Widyastuti A (2017). *Pengetahuan, Sikap Dan Tindakan Mahasiswa Boga Universitas Negeri Yogyakarta Tentang Konsumsi Makanan Cepat Saji (Fast Food)*. Universitas Negeri Yogyakarta.

