University of Thi-Qar Journal of Science (UTJsci)
E-ISSN:2709-0256, P-ISSN: 1991-8690, Vol. (10), No.1(Special Issue: ISCAMET), April. 2023

Association Abdominal Obesity with Dietary Habits and demographic Variables among Students at Southern Technical University

AbeerKhiryDekan
Collage of Health and Medical Technology/Southern Technical University
Basrah /Iraq
abeerkhiry11@gmail.com

JabbarTaresh Ahmed
Collage of Health and Medical Technology/Southern Technical University
Basrah /Iraq
alalijabbar@stu.edu.iq.com

Sajjad Salim Issa
College of Nursing /University of Basrah /Iraq
sajjadalattar@yahoo.com

***Abstract*—Obesity and overweight are still very common diseases affecting most regions of the world. According to studies, the increasing obesity prevalence in both adults and children of all ages, regardless of geography, race, or socioeconomic status. The Abdominal obesity is featured by fat accumulation in abdomen or atrophy of the large muscle group or both. So, the waist circumference (WC) is greater than the hip circumference (higher WHR) because of the accumulation of fat inside the abdomen. This study aims to find an association between abdominal obesity and dietary habits.**

Materials and methods: A cross-sectional survey; of 384 participants randomly selected from the formations of the Southern Technical University in Basra Governorate southern Iraq from (The College of Health and Medical Technologies, Technical College Administrative. Technical College of Engineering and Technical Institute in Basra) the data was gathered by conducting in-person interviews with the participants and utilizing thorough self-reporting survey questionnaires. Results: The present study reveals that more than half (51.0%) of students rest in the normal range. While 49.0% of them have abdominal obesity. Conclusion: With the exception of rice and soft drinks, the results of the current study showed no significant correlation between dietary habits AND WC. TO ADDRESS THE HIGH INCIDENCE OF ABDOMINAL **obesity, among university students who need health education programs.**

Keywords: Obesity, abdominal, Students, Dietary habits.

I. INTRODUCTION:

Obesity is a major risk factor for a number of non-communicable diseases, such as "diabetes mellitus, cardiovascular disease, hypertension and stroke, and certain forms of cancer" leading to increased morbidity and premature mortality [1].

A healthy life is a prerequisite for proper nutrition, which is a basic human necessity. The nutrition that we obtain from eating has a positive impact on the physical development and maintenance of normal bodily functions [2].

Obesity is influenced by an environment that is obesogenic [3]. Fastfood intake is strongly associated with increased obesity prevalence in several Western nations, according to several lines of research [4]. Fast food is typically considered to be calorie-dense, low in nutrients, and high in sugar and saturated fat. Examples include hamburgers, French fries, pizza, drinks, and onion rings [5].

According to the World Health Organization (WHO), 13% of individuals worldwide were obese and 39% of persons aged 18 and older were overweight in 2016 [6]. Based on the WHO report, 1 in 3 adults worldwide is overweight, and 1 in 10 is obese. Although undernutrition is more common in poor nations, during the past 20 years, overweight and obesity have also been rising quickly in low- and middle-income nations [7].

Obesity's effects on health in emerging nations also place a strain on personal and governmental healthcare resources [8].

Numerous individual characteristics, including predilection for high-fat and high-sugar (HFHS) food, degree level, medical education background, body mass index (BMI), physical activity, and gender, may have an impact on students' fast food intake. Obese people reportedly preferred takeout meals substantially more than normal weight people [9].

Aims of the study:

1- To find an association between abdominal obesity and dietary habits.
2- To determine the correlation between abdominal obesity and some socio-demographic item.

II. MATERIALS AND METHODS:

A cross-sectional survey of 384 participants who were randomly selected (simple random sample) from three colleges and one institute (College of Health and Medical Technology, Administrative Technical College,

Technical College of Engineering, and Basra Technical Institute) from the formations of the Southern Technical University, Basra Governorate / Iraq s. data collection duringthe period from November 2021 to June 2022.

A. *The study tools*

The information was gathered by conducting in-person interviews with the students and utilizing thorough personality survey questionnaires. Two components make up the study questionnaire; the first piece contains socio-demographic information (age, gender, relationship status, residence, income level, academic stage, and institution) as well as physical assessment like waist circumference. While the lifestyle and dietary habits of the pupils are covered in section two.

B. Statistical analysis:

The statistical software offered by SPSS-25 was used to examine the data. Data were presented using straightforward frequencies, %, average, variance, and ranging measurements (minimum and maximum values). The Chi-Square test (2-test) was used to determine the significance of differences between varying percentages (qualitative data). Whenever the P-value was 0.05 or less, a statistically significant difference was taken into consideration. Finding several factors individually linked to abdominal obesity using univariate logistic regression

III. RESULTS:

Table (1), (2) reveals the standard patient's classification according to BMI an WC

Table (1): Classification of overweight and obesity based on BMI

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	Overweight
30.0–34.9	class I obesity (Obese)
35.0–39.9	class II obesity (Sever obesity)
≥ 40.0	class III obesity (Morbid obesity)
≥ 40- 50	Super obese

Table (2): Health risks associated with waist circumstance

Level	Men	Women	Health risk
Below action level 1	<94	<80	Low
Action level 1-2	≥94-101.9	≥80-87.9	Increase
Above action level 2	≥102	≥88	High

Table 3 depicts the socioeconomic composition of undergraduates. The age means± SD was (21.09±1.683 y), and the age range at the time of the study was 18-26 y. The age group (18-20 years) had the highest proportion (44.5%), while the age group 24-26 years had the lowest rate (11.5 %). According to the study, one-half of the students (50.0 %) were male, while the other half were female. In this study, 325 (84.6 %) of the participants were single. The majority of participants (43.5 %) resided in the city. In relation to Students income, (51.8%) earn a good income, while the minority (16.4%) are low income.

Table (3) Distribution of University Students according to Socio-demographic Characteristics

Socio-demographic		No.	Percent (%)
Age group	18 - 20 years	171	44.5
	21 - 23 years	169	44.0
	24 - 26 years	44	11.5
	Mean± SD (Min-Max)	21.09±1.683 (18-26)	
Gender	Male	192	50.0
	Female	192	50.0
Marital	Single	325	84.6
	Married	43	11.2
	Engaged	16	4.2
Residency	City	167	43.5
	Village	131	34.1
	student dorm	86	22.4
Income	Low	63	16.4
	Moderate	122	31.8
	High	199	51.8
college	Health	96	25.0
	Administrative	96	25.0
	Engineering	96	25.0
	Institute of Basra	96	25.0
class	first stage	120	31.3
	second stage	120	31.3
	third stage	72	18.8
	fourth stage	72	18.8

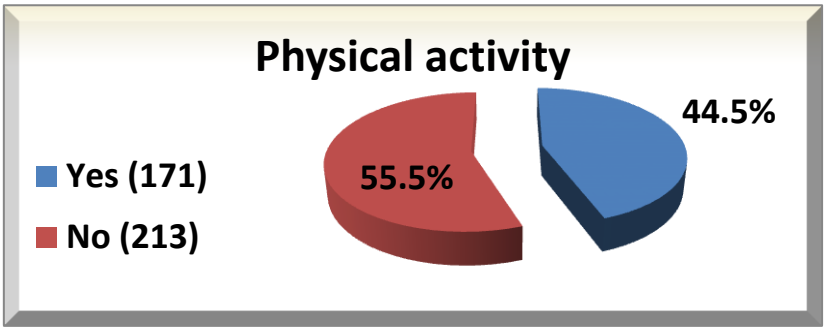

Figure (1) represented distribution of students according to Physical activity

According to figure (1) to the present investigation, the greatest rate of students, 213 (55.5 %), were insufficiently active, while the least rate, 171 (44.5%), were healthy and active.

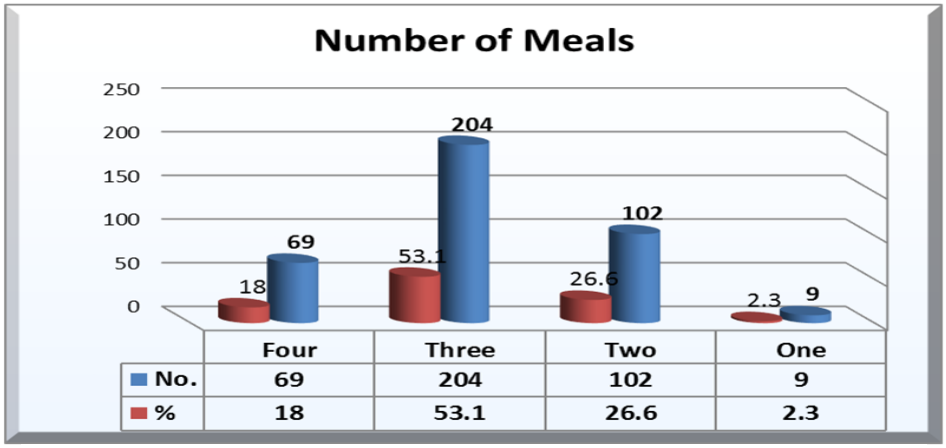

Figure (2) represented distribution of students according to number of meals

Figure 2 shows that the maximum of participant, 204 (53.1 %), ate 3 main meal per day, whereas, the lowest number, (9 (2.3 %), ate once meal each day.

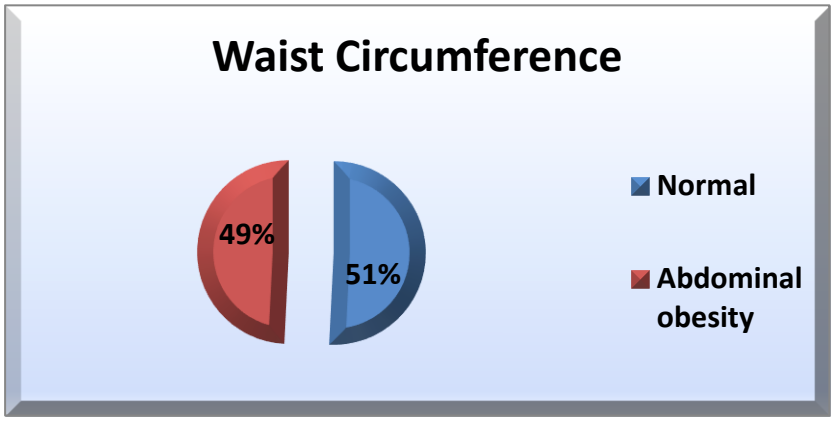

Figure (3) represented distribution of students according to WC categories

Figure 3 indicates that more than half of the students (51.0 %) are in the normal range. While 49.0 % of them are obese in the abdomen.

Table 4 depicts the link between the explored sample's dietary habits and WC. The existing researchers showed no significant relationship between items of eating patterns and WC (P. value >0.05) with the exception of soft drinks and rice, which found a stronger correlation with WC (P=0.002, and P=0.013) in both.

Table (4) Association between the dietary habits of the studied sample and Waist Circumference categories

			Normal	abdominal obesity	X^2	P. value
Vegetables	Rarely	No	21	25	1.079[a]	0.782
		%	45.7%	54.3%		
	Once or twice per week	No	47	39		
		%	54.7%	45.3%		
	Three or four time/day	No	26	24		
		%	52.0%	48.0%		
	Daily	No	54	48		
		%	26.7%	23.8%		
Fruits	Rarely	No	26	25	1.096[a]	0.778
		%	51.0%	49.0%		
	Once or twice per week	No	57	49		
		%	53.8%	46.2%		
	Three or four time/day	No	31	27		
		%	53.4%	46.6%		
	Daily	No	81	88		
		%	47.9%	52.1%		
Meat	Rarely	No	32	26	3.402[a]	0.334
		%	55.2%	44.8%		
	Once or twice per week	No	82	74		
		%	52.6%	47.4%		
	Three or four time/day	No	49	44		
		%	52.7%	47.3%		
	Daily	No	32	45		
		%	41.6%	58.4%		
Sweets	Daily	No	66	70	3.388[a]	0.336
		%	48.5%	51.5%		
	Three or Three	No	26	34		
		%	43.3%	56.7%		
	Once or Twice	No	53	39		
		%	57.6%	42.4%		
	Rarely	No	50	46		
		%	52.1%	47.9%		
Bread	Daily	No	161	156	1.234[a]	0.745
		%	50.8%	49.2%		
	Three or Four	No	14	11		
		%	56.0%	44.0%		
	Once or Twice	No	10	14		
		%	41.7%	58.3%		
	Rarely	No	10	8		
		%	55.6%	44.4%		
Soft drink/juice	Daily	No	61	47	14.928[a]	0.002*
		%	56.5%	43.5%		
	Three or Four	No	27	33		
		%	45.0%	55.0%		
	Once or Twice	No	47	74		
		%	38.8%	61.2%		
	Rarely	No	60	35		
		%	63.2%	36.8%		
Milk	Rarely	No	108	107	2.121[a]	0.548
		%	50.2%	49.8%		
	Once or twice per week	No	42	38		
		%	52.5%	47.5%		
	Three or four time/day	No	14	8		
		%	63.6%	36.4%		
	Daily	No	31	36		
		%	46.3%	53.7%		
Tea	Daily	No	108	122	3.721[a]	0.293
		%	47.0%	53.0%		
	Three or Four	No	9	9		
		%	50.0%	50.0%		

	Once or Twice	No	18	14		
		%	56.3%	43.8%		
	Rarely	No	60	44		
		%	57.7%	42.3%		
Coffee	Daily	No	24	33	2.883[a]	0.410
		%	42.1%	57.9%		
	Three or Four	No	8	11		
		%	42.1%	57.9%		
	Once or Twice	No	43	37		
		%	53.8%	46.3%		
	Rarely	No	120	108		
		%	52.6%	47.4%		
Fast food	Daily	No	34	39	5.046[a]	0.168
		%	46.6%	53.4%		
	Three or Four	No	29	41		
		%	41.4%	58.6%		
	Once or Twice	No	62	46		
		%	57.4%	42.6%		
	Rarely	No	70	63		
		%	52.6%	47.4%		
margarine	Daily	No	37	52	5.364[a]	0.147
		%	41.6%	58.4%		
	Three or Four	No	12	15		
		%	44.4%	55.6%		
	Once or Twice	No	23	23		
Rice	**Daily**	No	178	177	10.847[a]	0.013*
		%	50.1%	49.9%		
	Three or Four	No	4	10		
		%	28.6%	71.4%		
	Once or Twice	No	10	1		
		%	90.9%	9.1%		
	Rarely	No	3	1		
		%	75.0%	25.0%		

Table 5 demonstrate that there is no a significant association between socio-demographic variables with abdominal obesity (P. value >0.05).

Table (5) Univariate Logistic regression analysis to identify some variables independently associated with abdominal obesity

		B	P. value	OR	95% C.I. for OR	
					Lower	Upper
Age group per years	18 - 20 years	Reference				
	21 - 23 years	0.093	0.667	1.098	0.717	1.680
	24 - 26 years	0.497	0.147	1.643	0.839	3.217
Income	Low	Reference				
	moderate	0.061	0.845	1.062	0.577	1.955
	High	0.209	0.470	1.233	0.699	2.176
Marital	Single	Reference				
	Married	0.409	0.214	1.505	0.790	2.864
	engaged	0.080	0.876	1.083	0.397	2.956
Residency	City	Reference				
	village	0.287	0.220	1.333	0.842	2.108
	student dorm	0.227	0.394	1.254	0.745	2.112
Gender	Male	Reference				
	Female	-0.271-	0.185	0.762	0.511	1.139

Table 6 demonstrates that thereis no significant association between Physical Activity and the Number of meals with Waist circumference (P. value >0.05). Although there was no relationship between physical activity and the number of meals with central obesity according to our study, physical activity reduces the risk of abdominal obesity by 53.2% in the total study group.

Table 6 The association between Physical Activity and Number of meals with Waist circumference

			WC		
			Normal	Abdominal obesity	P. value
Physical Activity	yes	No.	91	80	0.392
		%	53.2%	46.8%	
	No	No.	104	109	
		%	48.8%	51.2%	
Number of meals	One	No.	91	80	0.206
		%	53.2%	46.8%	
	Two	No.	104	109	
		%	48.8%	51.2%	
	Three	No.	91	80	
		%	53.2%	46.8%	
	Four	No.	104	109	
		%	48.8%	51.2%	

IV. DISCUSSION

Throughout this research, the largest rate (44.5%) was found in the age range of 18-20 years, while the least rate (11.5%) was in the age range of 24-26 years. These findings coincided with research carried out at the University of Gujarat in Pakistan [10], which found about 229 (53.0 %) of the participant were between the ages of eighteen to 21 years. As well, the above results are consensus with the preceding study results accomplished by Ahmad et al., (2019), who noticed the same outcomes [11].

According to the outcomes of our research, the greatest possible percentage of included participants, 213 (55.5%), were physically inactivity, whilst the least number, 171 (44.5%), were fit and active. These findings corroborate a newly published study that found that the majority of Saudi teenagers (71 %) were sedentary [12]. Keating et al., (2005) revealed about 40-59 % of undergraduate students were insufficiently physically active [13].

In this survey, students who ate three meals a day made up the largest percentage—204—and those who ate one meal a day made up the lowest—9 (2.3 %). These findings were in line with those of a research done at Narran University in Narran, Saudi Arabia [14], which found that 50.0% of students ate three meals each day.

The current study found that there was no statistical linkage between items of dietary habit and WC (P. value >0.05) except for soft drinks, and rice, which found a significant association with WC (P=0.002, and P= 0.013) respectively. These findings are consistent with those of Ghaith and Ibrahim (2020) [15], who found no obvious relation between the majority of dietary practices and WC. A published report by WHO concluded in it is that WC, not WHR or BMI, was the best indicator for determining excess body weight [16]. Although there is no proportional relationship between the majority of nutrient content and WC, our study, in line with other research, shows connections between dietary habits marked by high consumption of fruits, veggies, legumes, and whole grains and lower WC in each country [17;18; 19].

The results of this study indicate that there is a significant association between soft drinks and rice with abdominal obesity (P. value <0.05). This result agreed with the study findings conducted by [20] who revealed that there was a significant association between soft drinks with abdominal obesity (P. value <0.05). Another study by [21] revealed that there was a significant association between rice with abdominal obesity (P. value <0.05). These results may be interpreted according to scientific reasons, which are: A prior comprehensive analysis among Asian populations found that eating rice with a high glycemic index increased the chance of gaining weight [22]. Soft drinks often have a high glycemic load, low fiber content, high energy density, and low micronutrient content [23]

The socio-demographic characteristics of the analyzed sample do not significantly correlate with WC in this study (P value > 0.05). These findings corroborated those of a study done at Taif University in the Kingdom of Saudi Arabia (Hamam et al., 2017) [24], which concluded there is no meaningful correlation between socio-demographic factors and WC (P value >0.05). Also, these results agreed with the study findings [25] revealing that there was no significant

association between the socio-demographic characteristics and abdominal obesity (P. value >0.05).

Although there was no relationship between physical activity and the number of meals with central obesity according to our study, physical activity reduces the risk of abdominal obesity by 53.2% in the total study group. This result is in agreement with [26] which found that higher physical activity reduces the risk of abdominal obesity (WC) by 61%. Another study by [27] revealed that low levels of physical activity were a significant risk factor for the prevalence of abdominal obesity in boys [OR 1.91; 95% CI (1.06-3.43)]. According to a scientific theory cited by [28], the impact of physical exercise on decreasing abdominal obesity may be attributable to this theory. According to the IRAS Family Study (Insulin Resistance Atherosclerosis Study), studies in people who exercised compared to those who exercised infrequently or not at all discovered that there was a drop in adipose, visceral, and subcutaneous tissues. As for the number of meals in our research, the current study reveals that increasing the frequency of meals (>3 times) increases central obesity, these results agreed with the study findings done by [25]. This may be explained according to Malik et al., (2013) [29], who indicated that when a person's caloric intake exceeds their energy expenditure, weight gain results from a positive energy balance. Obesity is a direct result of excessive energy consumption brought on by a high-calorie intake.

V. Conclusions:

According to the results of the current study, WC was not statically related to any dietary pattern, except for rice vand soft drinks. The highest abdominal obesity prevalence must be addressed through a health promotion program.

REFERENCE:

[1] World Health Organization, "Controlling the global obesity epidemic," *WHO*, 2022. [Online]. Available: https://www.who.int/activities/controlling-the-global-obesity-epidemic.

[2] H. A. Haider, M. A, Jabber, T. A, & Faiz, "Epidemiology and Knowledge, Attitude and Practices Study of Nutrition Iron Deficiency among Preschool Children in Al Madinha, Basra. Thesis from Southern Technical University/ Collage of Health and Medical Technology/ Basrah," 2020.

[3] J. Williams *et al.*, "Associations between food outlets around schools and BMI among primary students in England: a cross-classified multi-level analysis," *PLoS One*, vol. 10, no. 7, p. e0132930, 2015.

[4] M. Virtanen *et al.*, "Fast-food outlets and grocery stores near school and adolescents' eating habits and overweight in Finland," *Eur. J. Public Health*, vol. 25, no. 4, pp. 650–655, 2015.

[5] Y. Wang, L. Wang, H. Xue, and W. Qu, "A review of the growth of the fast food industry in China and its potential impact on obesity," *Int. J. Environ. Res. Public Health*, vol. 13, no. 11, p. 1112, 2016.

[6] World Health Organization, "Obesity and overweight," *WHO*, 2022. [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight.

[7] T. Biswas, M. J. Uddin, A. Al Mamun, S. Pervin, and S. P Garnett, "Increasing prevalence of overweight and obesity in Bangladeshi women of reproductive age: Findings from 2004 to 2014," *PLoS One*, vol. 12, no. 7, p. e0181080, 2017.

[8] T. Siddiquee *et al.*, "Prevalence of obesity in a rural Asian Indian (Bangladeshi) population and its determinants," *BMC Public Health*, vol. 15, no. 1, pp. 1–9, 2015.

[9] C. Proserpio, M. Laureati, S. Bertoli, A. Battezzati, and E. Pagliarini, "Determinants of obesity in Italian adults: the role of taste sensitivity, food liking, and food neophobia," *Chem. Senses*, vol. 41, no. 2, pp. 169–176, 2016.

[10] M. Irfan, M. Jabbar, and S. Hameed, "Dietary habits and prevalence of underweight/obesity in Students of University of Gujrat, Pakistan," *J. Liaquat Univ. Med. Heal. Sci.*, vol. 18, no. 02, pp. 175–180, 2019.

[11] M. S. Ahmad, Hafiz Saleem Faisal ShahzadSadia, "Association of body mass index with dietary habits among University students," *Int. J. Curr. Res.*, vol. 11, no. 4, pp. 3091–3097, 2019.

[12] H. M. Al-Hazzaa, "Physical activity, fitness and fatness among Saudi children and adolescents," *Saudi Med J*, vol. 23, no. 2, pp. 144–150, 2002.

[13] X. D. Keating, J. Guan, J. C. Piñero, and D. M. Bridges, "A meta-analysis of college students' physical activity behaviors," *J. Am. Coll. Heal.*, vol. 54, no. 2, pp. 116–126, 2005.

[14] H. M. Al-Shehri *et al.*, "Assessment of lifestyle and eating habits among undergraduate students in Najran University, Najran, Saudi Arabia," *Int. J. Med. Sci. Public Heal.*, vol. 6, no. 3, pp. 638–647, 2017.

[15] M. M. Ghaith and M. O. Ibrahim, "Dietary habits, eating practices and lifestyle pattern as predictors of increased waist circumference amongst University of Umm Al-Qura female students: A cross-sectional study (Obesity Associated Risk Factors)," *Med. Sci.*, vol. 24, no. 101, pp. 351–359, 2020.

[16] World Health Organization, "Waist circumference and waist-hip ratio: report of a WHO expert consultation, Geneva, 8-11 December 2008," 2011.

[17] A. Esmaillzadeh, M. Kimiagar, Y. Mehrabi, L. Azadbakht, F. B. Hu, and W. C. Willett, "Dietary patterns, insulin resistance, and prevalence of the metabolic syndrome in women," *Am. J. Clin. Nutr.*, vol. 85, no. 3, pp. 910–918, 2007.

[18] A. N. Funtikova, A. A. Benítez-Arciniega, S. F. Gomez, M. Fitó, R. Elosua, and H. Schröder, "Mediterranean diet impact on changes in abdominal fat and 10-year incidence of abdominal obesity in a Spanish population," *Br. J. Nutr.*, vol. 111, no. 8, pp. 1481–1487, 2014.

[19] A. Esmaillzadeh and L. Azadbakht, "Major dietary patterns in relation to general obesity and central adiposity among Iranian women," *J. Nutr.*, vol. 138, no. 2, pp. 358–363, 2008.

[20] M. M. Papamichael *et al.*, "Associations between soft-drink consumption and lifestyle patterns in overweight and obese European adults: Feel4 Diabetes Study," *Nutrition*, vol. 103, p. 111769, 2022.

[21] X. Yin, Y. Chen, W. Lu, T. Jin, and L. Li, "Association of dietary patterns with the newly diagnosed diabetes mellitus and central obesity: a community based cross-sectional study," *Nutr. Diabetes*, vol. 10, no. 1, pp. 1–9, 2020.

[22] Z. Shi, A. W. Taylor, G. Hu, T. Gill, and G. A. Wittert, "Rice intake, weight change and risk of the metabolic syndrome development among Chinese adults: the Jiangsu Nutrition Study (JIN)," *Asia Pac. J. Clin. Nutr.*, vol. 21, no. 1, pp. 35–43, 2012.

[23] M. Mazidi and J. R. Speakman, "Association of Fast-Food and Full-Service Restaurant Densities With Mortality From Cardiovascular Disease and Stroke, and the Prevalence of Diabetes Mellitus,"*J. Am. Heart Assoc.*, vol. 7, no. 11, p. e007651, 2018.

[24] F. A. Hamam, A. S. Eldalo, A. A. Alnofeie, W. Y. Alghamdi, S. S. Almutairi, and F. S. Badyan, "The association of eating habits and lifestyle with overweight and obesity among health sciences students in Taif University, KSA," *J. Taibah Univ. Med. Sci.*, vol. 12, no. 3, pp. 249–260, 2017.

[25] H. M. E. Nai and M. A. Lubijarsih, "Frequency of online food ordering is not risk factor of central obesity in women aged 20-49 years," *J. Gizi dan Diet. Indones. (Indonesian J. Nutr. Diet.*, vol. 9, no. 1, pp. 19–26, 2022.

[26] E. Błaszczyk-Bębenek *et al.*, "Risk factors and prevalence of abdominal obesity among upper-secondary students," *Int. J. Environ. Res. Public Health*, vol. 16, no. 10, p. 1750, 2019.

[27] A. Suder *et al.*, "Prevalence and risk factors of abdominal obesity in Polish rural children," *Homo*, vol. 66, no. 4, pp. 357–368, 2015.

[28] K. G. Hairston, M. Z. Vitolins, J. M. Norris, A. M. Anderson, A. J. Hanley, and L. E. Wagenknecht, "Lifestyle factors and 5-year abdominal fat accumulation in a minority cohort: the IRAS family study,"*Obesity*, vol. 20, no. 2, pp. 421–427, 2012.

[29] V. S. Malik, W. C. Willett, and F. B. Hu, "Global obesity: trends, risk factors and policy implications," *Nat. Rev. Endocrinol.*, vol. 9, no. 1, pp. 13–27, 2013.