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Effects of Fast Food Consumption and Lifestyle on Body Weight Among Medical Students at Al-Qadisiyah University

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ABSTRACT: Overweight and obesity among university students are rising, and medical students are of particular concern because their dietary and lifestyle habits may later influence how they counsel patients, yet data from Iraq remain limited; this study aimed to describe body weight status among medical students at the University of Al-Qadisiyah and its relationship with fast-food intake, diet and lifestyle. A cross-sectional study was conducted from January to July 2026 among 360 students from all six academic years, selected by convenience sampling; a structured Arabic questionnaire captured sociodemographic, dietary and lifestyle data, while weight, height and waist circumference (WC) were measured and classified using WHO criteria, with associations tested by chi-square or Fisher's exact test at $p<0.05$. Most students had normal BMI (63.1%), while 25.8% were overweight, 10.3% underweight and 0.8% obese; high-risk WC was more common in women (51.1%) than men (20.9%) and was associated with BMI in both sexes ($p<0.001$). BMI category was significantly associated with age, sex, academic year, income sufficiency and marital status (all $p<0.001$), and with most dietary and lifestyle factors, although several dietary associations were reversed, with overweight more frequent among students reporting never consuming fast food, fried food or soft drinks. Physical inactivity, screen time, short sleep and smoking were also linked to higher BMI. Overweight affected one in four medical students, and central obesity was common among women; the reversed dietary associations likely reflect reverse causation and under-reporting rather than a protective effect, underscoring the need for prospective studies and university-based health-promotion programmes.

1. INTRODUCTION

Abnormal body weight is among the most common health problems worldwide. WHO estimates that in 2022 about 43% of adults were overweight and 16% obese, while over half a billion remained underweight — a double burden of malnutrition seen in many countries [1]. Mean BMI has risen steadily, especially among young adults [2], and high BMI is a leading cause of heart disease, diabetes, cancer and early death [3].

Two behaviours drive this trend: rising consumption of fast food and ultra-processed products, which are energy-dense and encourage overeating [4,5]; and more sedentary living, where prolonged sitting is linked to general and abdominal obesity [6].

University students face both trends: busy schedules and food-outlet-dense campuses favour unhealthy eating, and many studies report high overweight and obesity rates in this group [7,8]. Medical students are a distinct subgroup: despite training in nutrition and disease prevention, they often skip meals, eat fast food frequently, and study long hours with little exercise [9]. A recent meta-analysis found about one in five medical students worldwide is overweight and one in ten obese [10], which matters beyond the individual since physicians' own habits shape how confidently they counsel patients on weight, diet and exercise [11].

In Iraq, rapid urbanisation and changing food habits have displaced traditional diets, and overweight is now common among university students [12]. Local estimates vary widely: an earlier study at the same college reported that more than 90% of medical students had abnormal body weight, with 48.9% overweight and 41.8% obese [13], far higher than reported elsewhere, likely reflecting differences in sampling and measurement rather than a true difference.

Few Iraqi studies examine fast-food consumption and lifestyle together in medical students, and most regional work relies on self-reported height and weight. This study therefore describes body weight status, using directly measured weight, height and waist circumference, among medical students at the College of Medicine, University of Al-Qadisiyah, and examines how BMI category relates to fast-food intake, diet, physical activity, screen time, sleep and other lifestyle factors.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This cross-sectional study was conducted at the College of Medicine, University of Al-Qadisiyah, Al-Diwaniyah, Iraq, between January and July 2026, during the 2025–2026 academic years. Data were collected over two semesters to reach students from all six academic years. Reporting followed STROBE recommendations for cross-sectional studies.

2.2 Participants and Sample size

Eligible participants were students enrolled in the College of Medicine during 2025–2026, from any academic year, present during data collection, who gave informed consent. Exclusions were declined participation, incomplete questionnaires, a chronic disease or medication affecting body weight, or pregnancy. Sample size was calculated with Thompson's formula for a finite population [14], using a total enrolment of 2,233 students, an expected proportion of 50%, 95% confidence level and 5% margin of error, giving 328; after adding 10% for non-response, the target became 361. In practice, 360 students were recruited by convenience sampling from lecture halls and clinical training areas.

2.3 Data Collection Tool

Data were obtained with a structured Arabic questionnaire developed for this study, content-validated by four family and community medicine experts and piloted on 20 students (excluded from the final analysis) before minor revisions. The instrument had five sections: sociodemographic data; anthropometric measurements; fast-food behaviour (frequency of fast-food, fried-food and traditional-food intake, soft drinks with fast food, preference for fast food, eating with others, and choosing healthier options); lifestyle (exercise, screen time, sleep, stress, meal skipping and smoking); and eating habits (meal frequency, breakfast skipping, meal timing, snacking, fruit and vegetable intake, energy drinks and nutrition-label use). Frequency items used a four-point scale (never, rarely, sometimes, always); portion size and total energy intake were not measured.

2.4 Anthropometric Measurements

Weight and height were measured directly by the researcher using a calibrated scale and stadiometer, participants in light clothing without shoes, avoiding the error typical of self-stated values. BMI was calculated as weight (kg)/height² (m) and classified per WHO criteria as underweight (<18.5 kg/m²), normal (18.5–24.9), overweight (25.0–29.9) or obese (≥30.0) [15]. Waist circumference was measured with a non-extensible tape at the midpoint between the lower rib and iliac crest, to the nearest 0.1 cm, and classified by WHO cut-offs [16]: women, <80 cm normal, 80–87.9 cm increased risk, ≥88 cm high risk; men, <94 cm normal, 94–101.9 cm increased risk, ≥102 cm high risk.

2.5 Statistical Analysis

Data were entered in Microsoft Excel 2016 and analysed with IBM SPSS Statistics version 25. Categorical variables are presented as frequencies and percentages. Associations between BMI category and each variable were tested with Pearson's chi-square test, or Fisher's exact test when more than 20% of expected cell counts were below five, at a two-sided $p<0.05$. All analyses were bivariate and unadjusted; no multivariable model was fitted. Because only three participants were obese, p-values involving obesity should be read as exploratory.

3. RESULTS AND DISCUSSION

3.1 Characteristics of the Participants

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All 360 recruited students completed the study. Nearly half were aged 21–23 years (46.1%), most others 18–20 years (43.3%), with men and women almost equally represented (50.6% and 49.4%). Second-year students formed the largest group (25.0%). The sample was mostly urban (97.2%), unmarried (92.5%) and living with family (98.6%), with most reporting sufficient family income (79.1%). Most had normal BMI (63.1%); 25.8% were overweight, 10.3% underweight and 0.8% obese. Waist circumference showed a clear sex difference: 51.1% of women were in the increased/high-risk range, versus 20.9% of men (Table 1).

Table 1: Sociodemographic and Anthropometric Characteristics of the Participants (n = 360)

Variable	Category	n	%
Age (years)	18–20	156	43.3
	21–23	166	46.1
	>23	38	10.6
Sex	Male	182	50.6
	Female	178	49.4
Academic year	First	60	16.7
	Second	90	25.0
	Third	56	15.6
	Fourth	30	8.3
	Fifth	49	13.6
	Sixth	75	20.8
Residence	Urban	350	97.2
	Rural	10	2.8
Income sufficiency	Enough	285	79.1
	Partly enough	55	15.3
	Not enough	20	5.6
Marital status	Unmarried	333	92.5
	Married	27	7.5
Living arrangement	With family	355	98.6
	Dormitory	5	1.4
BMI category	Underweight (<18.5)	37	10.3
	Normal (18.5–24.9)	227	63.1
	Overweight (25.0–29.9)	93	25.8
	Obese (≥30.0)	3	0.8
WC, women (n=178)	<80 cm (normal)	87	48.9
	80–87.9 cm (increased risk)	77	43.2
	≥88 cm (high risk)	14	7.9

WC, men (n=182)	<94 cm (normal)	144	79.1
	94–101.9 cm (increased risk)	33	18.2
	≥102 cm (high risk)	5	2.7

BMI, body mass index (kg/m²); WC, waist circumference. WC categories follow WHO cut-off points.

3.2 Fast-food, Dietary and Lifestyle Behaviours

Fast food was consumed sometimes or always by 57.3% of students, and only 12.5% never ate it; fried food was eaten sometimes/always by 80.5%. Soft drinks accompanied fast food in 71.4% of participants, and 48.6% preferred fast food over home-cooked meals at least sometimes. Traditional food was eaten regularly by only 50.8%. Fast food was usually social, eaten with others by 79.4%, and only 17.5% always chose healthier options when eating out. Lifestyle patterns were unfavourable: 66.4% did not exercise regularly, 67.8% had over 4 hours of daily screen time, 14.7% slept less than 6 hours, 79.8% felt stress affected their habits, 61.1% skipped meals due to a busy schedule, and 23.1% currently smoked. Eating habits followed suit: 85.3% skipped breakfast at least sometimes, 58.3% ate after 22:00, only 24.7% always ate fruit and vegetables, 73.6% consumed energy drinks occasionally or more, and 43.9% never read nutrition labels (Table 2).

Table 2: Fast-food, Dietary and Lifestyle Behaviours (n = 360)

Variable	Never %	Rarely %	Sometimes %	Always %
Fast-food consumption	12.5	30.3	28.1	29.2
Fried-food consumption	9.2	10.3	49.4	31.1
Traditional/local food	6.1	43.1	43.6	7.2
Soft drinks with fast food	11.1	17.5	43.9	27.5
Prefers fast food to home meals	37.5	13.9	21.9	26.7
Eats fast food with others	18.3	2.2	35.8	43.6
Chooses healthier options	28.9	2.2	51.4	17.5
Skips breakfast	13.9	0.8	41.4	43.9
Snacking	15.8	29.4	45.6	9.2
Fruit and vegetable intake	14.7	21.4	39.2	24.7
Energy drinks	25.0	1.4	65.3	8.3
Reads nutrition labels	43.9	2.2	40.8	13.1

Other lifestyle variables (n, %): regular exercise, yes 121 (33.6) / no 239 (66.4); daily screen time, <2 h 5 (1.4), 2–4 h 41 (11.4), >4 h 244 (67.8), unspecified general use 70 (19.4); sleep duration, <6 h 53 (14.7), 6–8 h 248 (68.9), >8 h 59 (16.4); stress affecting lifestyle, yes 287 (79.8); skips meals (busy schedule), yes 220 (61.1); current smoker, yes 83 (23.1); meals/day, two 125 (34.7), three or more 235 (65.3); timing of last meal, does not eat late 85 (23.6), before 22:00 65 (18.1), after 22:00 210 (58.3).

3.3 BMI and Sociodemographic/Anthropometric Factors

BMI category was significantly associated with age, sex, academic year, income sufficiency and marital status (all $p<0.001$), but not residence ($p=0.290$) or living arrangement ($p=0.396$). Excess weight rose from 19.9% at age 18–20 to 32.5% at 21–23 years, was more common in women (30.9%) than men (22.5%), while underweight was five times more common in men (17.0% vs 3.4%). It peaked in fourth-year (40.0%) and sixth-year (36.0%) students, was lowest in second year (14.4%), and obesity occurred only in the sixth year. Excess weight reached 47.3% among students with only partly sufficient income, versus 22.8% among those with sufficient income, and was higher among married (51.8%) than unmarried students (24.6%).

Waist circumference was strongly associated with BMI in both sexes ($p<0.001$): every woman with WC ≥88 cm, and every man with WC ≥94 cm, was overweight or obese (Table 3).

Table 3: Association between BMI Category and Sociodemographic/Anthropometric Factors (n = 360)

Variable	Category (n)	Underweight (%)	Excess weight* (%)	p-value
Age (years)	18–20 (156)	19.9	19.9	<0.001
	21–23 (166)	3.6	32.5	
	>23 (38)	0.0	28.9	
Sex	Female (178)	3.4	30.9	<0.001
	Male (182)	17.0	22.5	
Academic year	First (60)	33.3	25.0	<0.001
	Second (90)	8.9	14.4	
	Third (56)	10.7	25.0	
	Fourth (30)	10.0	40.0	
	Fifth (49)	0.0	30.6	
	Sixth (75)	0.0	36.0	
Residence	Urban (350)	10.6	26.0	0.290
	Rural (10)	0.0	50.0	
Income sufficiency	Enough (285)	10.2	22.8	<0.001
	Partly enough (55)	14.5	47.3	
	Not enough (20)	0.0	25.0	
Marital status	Unmarried (333)	8.7	24.6	<0.001
	Married (27)	29.6	51.8	
Living arrangement	With family (355)	10.4	27.0	0.396
	Dormitory (5)	0.0	0.0	
WC, women	<80 cm (87)	6.9	16.1	<0.001
	80–87.9 cm (77)	0.0	35.1	
	≥88 cm (14)	0.0	100.0	
WC, men	<94 cm (144)	21.5	2.1	<0.001
	94–101.9 cm (33)	0.0	100.0	
	≥102 cm (5)	0.0	100.0	

*Chi-square test, or Fisher's exact test where expected counts were small. *Excess weight = overweight + obese*

3.4 BMI, Fast Food and Dietary Behaviour

All dietary variables were significantly associated with BMI, but several ran opposite to expectation. Excess weight was highest among students who never ate fast food (40.0%), fried food (57.6%) or drank soft drinks with fast food (67.5%), and lowest among the most frequent consumers (15.3%, 18.8% and 16.1%; all $p<0.001$); all three obese students were among the

heaviest consumers of each. Traditional-food consumption behaved as expected, with excess weight highest among regular consumers (50.0% vs 13.6%; p<0.001), as did energy drinks, which showed the strongest gradient — 90.0% versus 17.8% among non-consumers (p<0.001). Students who always read nutrition labels or chose healthier options had the lowest excess-weight proportions (10.6% and 20.6%; both p<0.001) (Table 4).

Table 4: Association between BMI Category and Fast-food/Dietary Behaviours (n = 360)

Variable	Category (n)	Underweight (%)	Excess weight* (%)	p-value
Fast-food consumption	Always (105)	4.8	15.3	<0.001
	Sometimes (101)	7.9	34.7	
	Rarely (109)	22.0	24.8	
	Never (45)	0.0	40.0	
Prefers fast food to home meals	Always (96)	0.0	27.1	<0.001
	Sometimes (79)	20.3	21.5	
	Rarely (50)	16.0	42.0	
	Never (135)	9.6	23.7	
Fried-food consumption	Always (112)	4.5	18.8	<0.001
	Sometimes (178)	18.0	22.5	
	Rarely (37)	0.0	43.2	
	Never (33)	0.0	57.6	
Soft drinks with fast food	Always (99)	10.1	16.1	<0.001
	Sometimes (158)	12.0	22.2	
	Rarely (63)	12.7	28.6	
	Never (40)	0.0	67.5	
Traditional/local food	Always (26)	0.0	50.0	<0.001
	Sometimes (157)	3.2	27.4	
	Rarely (155)	15.5	23.9	
	Never (22)	36.4	13.6	
Eats fast food with others	Always (157)	8.3	19.1	0.005
	Sometimes (129)	10.1	31.0	
	Rarely (8)	0.0	62.5	
	Never (66)	16.7	31.8	
Chooses healthier options	Always (63)	7.9	20.6	<0.001
	Sometimes (185)	11.4	27.5	
	Rarely (8)	0.0	100.0	
	Never (104)	10.6	23.1	

Energy drinks	Always (30)	0.0	90.0	<0.001
	Sometimes (235)	8.9	22.6	
	Rarely (5)	0.0	0.0	
	Never (90)	17.8	17.8	
Reads nutrition labels	Always (47)	10.6	10.6	<0.001
	Sometimes (147)	12.9	32.7	
	Rarely (8)	0.0	0.0	
	Never (158)	8.2	22.2	

*Exposure was measured as reported frequency only; portion size and energy intake were not assessed. *Excess weight = overweight + obese combined.*

3.5 BMI, lifestyle and Eating Habits

Excess weight was more common among physically inactive students (28.9% vs 22.3%; p=0.009), current smokers (37.3% vs 23.5%; p<0.001), and those with over 4 hours of screen time (28.3%) or unspecified heavy use (38.6%), versus lower use (p<0.001). Short sleep (<6 hours) carried the highest excess-weight proportion (35.8%; p<0.001). Perceived stress (p=0.312) and meal skipping (p=0.172) were not significant. Underweight was three times more common among students eating two meals/day than three or more (18.4% vs 6.0%; p=0.002). Breakfast skipping was significant (p=0.014) but not in the expected direction. Excess weight was highest among students who did not eat late at all (45.9%) and lowest among those eating after 22:00 (19.0%; p<0.001). Fruit and vegetable intake behaved as expected, lowest among regular consumers (15.7% vs 33.3%; p=0.002) (Table 5).

Table 5: Association between BMI Category and Lifestyle/Eating Habits (n = 360)

Variable	Category (n)	Under weight (%)	Excess weight* (%)	p-value
Regular exercise	Yes (121)	17.4	22.3	0.009
	No (239)	6.7	28.9	
Current smoking	Yes (83)	0.0	37.3	<0.001
	No (277)	13.4	23.5	
Daily screen time	<2 h (5)	0.0	0.0	<0.001
	2–4 h (41)	7.3	0.0	
	>4 h (244)	13.9	28.3	
	General use (70)	0.0	38.6	
Sleep duration	<6 h (53)	0.0	35.8	<0.001
	6–8 h (248)	13.7	22.6	
	>8 h (59)	5.1	35.6	
Stress affecting lifestyle	Yes (287)	9.4	28.6	0.312
	No (73)	13.7	20.5	

Skips meals (busy)	Yes (220)	10.9	25.5	0.172
	No (140)	9.3	28.5	
Meals per day	Two (125)	18.4	24.0	0.002
	Three or more (235)	6.0	28.1	
Skips breakfast	Always (158)	3.8	29.1	0.014
	Sometimes (149)	17.4	24.8	
	Rarely (3)	0.0	0.0	
	Never (50)	10.0	26.0	
Timing of last meal	Before 22:00 (65)	12.3	26.2	<0.001
	After 22:00 (210)	8.6	19.0	
	Does not eat late (85)	12.9	45.9	
Snacking	Always (33)	0.0	24.3	<0.001
	Sometimes (164)	12.8	28.7	
	Rarely (106)	15.1	22.6	
	Never (57)	0.0	29.8	
Fruit and vegetable intake	Always (89)	11.2	15.7	0.002
	Sometimes (141)	5.7	33.3	
	Rarely (77)	20.8	28.6	
	Never (53)	5.7	24.5	

*Regular exercise was defined as ≥30 minutes/week. *Excess weight = overweight + obese combined. "General use" reflects participants who did not specify a screen-time duration.*

3.4 Discussion

This study measured weight, height and waist circumference directly in 360 medical students and examined their relation to diet and lifestyle. Three findings stand out: about one quarter were overweight, but obesity was rare; central obesity was far more common in women; and although most behavioural variables were significant, several dietary associations pointed opposite to expectation.

The overweight prevalence (25.8%) is close to the global estimate for medical students of about one in five, while obesity (0.8%) is well below the global estimate of about one in ten [10]. This fits the young age of the sample, where excess weight may still be accumulating without reaching the obesity threshold, making this group a good target for early prevention.

Our results differ sharply from an earlier study at the same college, which reported 48.9% overweight and 41.8% obesity [13], most likely reflecting differences in sampling and measurement rather than a real change over time, and underscoring the value of directly measured data. The 10.3% underweight prevalence shows that the double burden of malnutrition described globally [1] is present here too, so programmes focused only on excess weight would miss a meaningful share of students.

More than half of female students (51.1%) had a waist circumference in the increased or high-risk range, compared with one-fifth of men. Because waist circumference reflects visceral fat and predicts cardiometabolic risk better than BMI in young adults [17], many women likely already carry a risk profile that BMI alone would miss — 14 with WC ≥88 cm were classified only as overweight. Adding waist circumference to routine student screening would be a simple, low-cost improvement.

Excess weight increased with age and academic year, peaking in later years, similar to Egyptian medical students, where overweight was more common in the clinical years [18]. Underweight was more common among younger, first-year students; women showed more excess weight, men more underweight. Excess weight was almost twice as common among students with only partly sufficient income as those with sufficient income, similar to findings linking economic constraint to nutrition through the lower cost of energy-dense food [19]. Married students showed higher excess weight, though based on only 27 students. Neither residence nor living arrangement was significant, likely due to the small numbers of rural and dormitory students; similar findings have been reported elsewhere [20].

The most striking finding is that excess weight was most common among students who reported never eating fast food, fried food or soft drinks with fast food, while frequent consumers were more often of normal weight — a pattern that seems to suggest unhealthy food is protective, contradicting strong evidence linking fast food and sugar-sweetened drinks to weight gain [4,21,22]. Several explanations, likely acting together, are more plausible than a true protective effect.

First, reverse causation: students already overweight may be the ones most likely to have already cut down on fast food, fried food and soft drinks. Second, social-desirability bias: heavier students may under-report unhealthy food more than lighter students. Third, frequency alone was measured, without portion size or total energy intake. Fourth, the analysis was unadjusted, leaving age, sex, academic year and physical activity free to confound each comparison.

Two points support this explanation. All three obese students were the heaviest consumers of fast food, fried food and soft drinks — the expected direction if high intake truly drives weight gain over time. Also, exposures less affected by under-reporting behaved as expected: energy drinks showed a strong gradient (90.0% excess weight among regular consumers), consistent with other Iraqi data [23]; low fruit and vegetable intake was linked to poorer weight status [24]; and label-reading and choosing healthier options were linked to normal BMI [25,26]. Similar reversals have been reported elsewhere [20], suggesting frequency-based questions alone cannot capture real dietary effects, and that detailed, prospective data are needed.

Lifestyle findings were more consistent with expectations. Two-thirds of students did not exercise regularly, and excess weight was more common among them, matching reviews of activity-based interventions in students [27]. Because "regular exercise" was defined here as only 30 minutes per week, far below the recommended 150, the "active" group likely still included many insufficiently active students, so this association may be underestimated. More than two-thirds had over four hours of daily screen time, and excess weight rose sharply above this threshold, consistent with evidence that screen time is linked to obesity independently of physical activity [6,28]. Short sleep carried the highest excess-weight proportion, consistent with sleep loss affecting appetite-regulating hormones [29]. Smokers showed more excess weight than non-smokers; although nicotine is often thought to suppress appetite, smoking may cluster with other unhealthy behaviours and affect appetite-hormone signalling in ways that do not always reduce weight [30]. Perceived stress and meal skipping were not significant, likely because both were too common in this sample for meaningful comparison. Breakfast skipping was almost universal and late eating common; these are best understood as group-level exposures requiring changes to timetables and campus food options, rather than factors distinguishing individual students.

The main strength of this study is that all anthropometric measurements, including waist circumference, were taken directly using standard WHO procedures, avoiding the reporting errors common in similar regional studies. The sample covered all six academic years with near-equal sex representation, and the questionnaire was expert-reviewed and piloted before use.

Several limitations apply. The cross-sectional design cannot establish cause and effect, central to interpreting the reversed dietary associations. Convenience sampling in a single, mostly urban, unmarried, family-residing population limits generalisability. Diet and lifestyle data were self-reported, measured as frequency only, and physical activity was assessed with one low-threshold question. All analyses were unadjusted, so residual confounding is likely. Only three participants were obese, so obesity percentages come from these three alone and are descriptive only. Future studies should use larger, representative Iraqi samples, quantitative dietary assessment, validated activity tools, and multivariable or longitudinal analysis.

4. CONCLUSION

Among 360 medical students at the University of Al-Qadisiyah, 25.8% were overweight, 10.3% underweight and 0.8% obese, and more than half of female students had a waist circumference in the increased or high-risk range. BMI category was significantly associated with age, sex, academic year, income sufficiency, marital status, waist circumference, physical inactivity, screen time, sleep duration, smoking and most dietary behaviours. The reversed dietary associations are best

explained by reverse causation, under-reporting and frequency-only measurement rather than any protective effect of unhealthy food, whereas energy-drink consumption, low fruit and vegetable intake and ignoring nutrition labels behaved as expected. Overweight and central obesity thus represent a real, largely preventable burden in a group about to enter clinical practice, where their own habits will shape how they advise patients. Practical steps include regular BMI and waist-circumference measurement in student health services, better availability and pricing of healthy campus food, physical activity in student programmes, and brief education on portion size, sugar-sweetened drinks and nutrition labels. Prospective studies with detailed dietary data and multivariable analysis are needed to clarify the role of fast food in young Iraqi adults.

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AUTHOR CONTRIBUTIONS

ZHS conceived and conducted the study, analyzed and interpreted the data, and drafted the manuscript.

JJM supervised the study, critically revised the manuscript, and approved the final version.

Both authors approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no competing interests.

ETHICS STATEMENT

The study was approved by the Committee of Scientific Research Ethics (CSRE), College of Medicine, University of Al-Qadisiyah (Issue No. 43, dated 18/8/2025). Written informed consent was obtained, participation was voluntary, confidentiality was maintained, and the study followed the Declaration of Helsinki.

DATA AVAILABILITY STATEMENT

The de-identified dataset is available from the corresponding author on reasonable request.

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