

Weight Matters: Investigating Overweight and Obesity Prevalence Among Municipal Bus Drivers and Its Nexus with Physical Activity, Stress, Emotional Eating, and Diet

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ABSTRACT

Aim: This study aims to investigate the prevalence of overweight and obesity among municipal bus drivers in İstanbul province and explore the intricate relationships between weight status, physical activity levels, stress perception, emotional eating tendencies, and dietary patterns within this occupational group.

Material and Methods: A cross-sectional study was conducted with the participation of 380 bus drivers. Data were collected through face-to-face interviews using a data collection tool consisting of an information form, the International Physical Activity Questionnaire Short Form (IPAQ-SF), the Perceived Stress Scale (PSS), the Emotional Eating Scale (EES), and 24-hour Dietary Recall.

Results: The findings revealed that 85.8% of the participants were overweight (52.6%) or with obesity (33.2%). The mean PSS score was 25.8 ± 6.7 , and the mean EES score was 29.3 ± 10.8 . The participants exhibited low physical activity levels (96.1%), with a mean of 246.2 ± 165.4 , signifying inactivity. Weak positive correlations were found between PSS and ESS scores. Dietary analysis showed a moderate energy intake of 1674.4 ± 429.5 kcal. Individual variability in energy intake and nutrient consumption patterns was evident.

Conclusion: The high prevalence of overweight and obesity among municipal bus drivers highlights the importance of targeted interventions for improved lifestyle and reduced health risks in this occupational group.

Keywords: Overweight and obesity, Bus drivers, Physical activity, Emotional eating, Diet

Ağırlık Önemlidir: Belediye Otobüs Şoförlerinde Fazla Kilo ve Obezite Prevalansı ile Fiziksel Aktivite, Stres, Duygusal Yeme ve Diyet İlişkisinin İncelenmesi

ÖZ

Amaç: Bu çalışma, İstanbul ili Belediye otobüs şoförleri arasındaki fazla kiloluluk ve obezite prevalansını araştırmayı amaçlamakta olup, bu meslek grubu içinde ağırlık durumu, fiziksel aktivite seviyeleri, stres algısı, duygusal yeme eğilimleri ve beslenme alışkanlıkları arasındaki ilişkileri keşfetmeyi hedeflemektedir.

Gereç ve Yöntemler: Kesitsel tipteki bu çalışma, 380 otobüs şoförünün katılımıyla gerçekleştirilmiştir. Veriler yüz yüze görüşmeler yoluyla toplanmış olup, veri toplama aracı olarak bir bilgi formu, Uluslararası Fiziksel Aktivite Anketi Kısa Formu (IPAQ-SF), Algılanan Stres Ölçeği (PSS), Duygusal Yeme Ölçeği (EES) ve 24 saatlik geriye dönük besin tüketim kaydı kullanılmıştır.

Bulgular: Katılımcıların %85.8'inin fazla kilolu (%52.6) veya obez (%33.2) olduğu saptanmıştır. Ortalama PSS skoru 25.8 ± 6.7 ve ortalama EES skoru 29.3 ± 10.8 olarak bulunmuştur. Katılımcılar düşük fiziksel aktivite seviyeleri sergilemişlerdir (%96.1) ve ortalama aktivite düzeyi 246.2 ± 165.4 olarak belirlenmiştir. PSS ve EES skorları arasında zayıf pozitif korelasyonlar bulunmuştur. Beslenme analizi, ortalama enerji alımının 1674.4 ± 429.5 kkal olduğunu göstermiştir. Enerji alımı ve besin tüketimi modellerinde bireysel değişkenliklerin belirgin olduğu tespit edilmiştir.

Sonuç: İstanbul İli Belediye otobüs şoförleri arasında fazla kilo ve obezitenin yaygınlığı, bu meslek grubunda yaşam tarzının iyileştirilmesi ve sağlık risklerinin azaltılması için hedefe yönelik müdahalelerin önemini vurgulamaktadır.

Anahtar Sözcükler: Fazla kiloluluk ve obezite, Otobüs şoförleri, Fiziksel aktivite, Duygusal yeme, Diyet

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INTRODUCTION

The rise of overweight and obesity as crucial public health concerns, attributed to the modern sedentary lifestyle and poor dietary choices, carries extensive implications for individual health, societal well-being, and economic burdens, ultimately amplifying the risk of chronic diseases and reducing the overall quality of life. Among the professions susceptible to these health challenges, transportation personnel, such as bus drivers, stand as a pivotal yet understudied group, confronting a unique interplay of factors that may impact their weight status. In this context, the present study delves into the prevalence of overweight and obesity among municipal bus drivers in İstanbul province, examining the intricate relationships between weight status, physical activity levels, stress perception, emotional eating tendencies, and dietary patterns.

Positioned as a prominent European megacity, İstanbul exemplifies urban sprawl and a burgeoning population. In such cities, effective public transportation is vital to ease infrastructure strain and reduce traffic congestion. İstanbul's daily life relies on its vast public transport network that serves millions. However, rapid urbanization has led to intricate traffic issues, marked by congestion and logistical challenges (1). Navigating this system, especially for municipal bus drivers, demands continuous time and resource management, highlighting the demanding and stressful nature of their job.

The alarming surge in overweight and obesity rates is a multifaceted issue requiring targeted investigation across diverse populations. As frontline workers responsible for the safe and efficient operation of municipal public transport, bus drivers are exposed to prolonged periods of sedentary activity, characterized by extended periods of sitting while operating vehicles (1). This sedentary nature of their occupation may predispose them to physical inactivity, a primary contributor to weight gain and associated health complications (2). Bus drivers also face daily challenges related to nutrition habits, characterized by prolonged meal intervals and frequent consumption of calorie-dense but nutritionally poor foods (3). Despite these drivers' critical role in urban mobility, their health status, particularly regarding weight-related concerns, remains inadequately examined.

Moreover, the connection between psychological well-being and eating behaviors has garnered increasing attention within the context of obesity research. Stress, a prevalent aspect of modern lifestyles, can profoundly influence eating behaviors, potentially leading to emotional eating patterns (4).

The bus driving profession, with its inherent stressors such as traffic congestion and time constraints, may engender heightened stress perception among drivers, thereby influencing their dietary choices. This juncture between emotional well-being, stress perception, and dietary behavior is an essential yet often overlooked facet in studying overweight and obesity.

The primary aim of this study is to comprehensively assess the prevalence of overweight and obesity among municipal bus drivers and to elucidate the intricate associations between weight status, physical activity levels, stress perception, emotional eating tendencies, and dietary intake. By probing these interwoven elements, this research seeks to enhance our understanding of the multifaceted determinants of overweight and obesity within a specific occupational group.

MATERIAL and METHODS

The study was conducted cross-sectionally between April and July 2023 after obtaining written permission from İstanbul Electric, Tram and Tunnel Administration (İstanbul Elektrik Tramvay ve Tünel; İETT) Directory General. Ethical approval was obtained from the İstanbul Okan University Ethics Committee (Date: 12.04.2023; Number: 165-10) in accordance with the Helsinki Declaration.

The universe of the study is 5460 bus drivers that were actively working at İETT for the time of the study. The minimum sample size was determined as 359 for a confidence level of 95% and a margin of error of 5%. Informed consent was obtained from the drivers by giving information about the purpose of the research and ethical issues before participation. The study's participation criteria required current employment in İETT as a municipal bus driver and voluntary engagement. A total of 380 bus drivers participated on a voluntary basis to complete the study. Data collection occurred over a three-month period after obtaining approval from the ethics committee. The face-to-face method of data collection ensured the inclusion of all participants, eliminating exclusions based on incomplete information or related reasons.

The data collection tool consists of an information form, the International Physical Activity Questionnaire Short Form (IPAQ-SF), the Perceived Stress Scale (PSS), the Emotional Eating Scale (EES), and lastly, 24-hour Dietary Recall, respectively.

Information Form

This part has questions related to anthropometric (weight and height) and sociodemographic information such as age, education and income level, and professional experience.

International Physical Activity Questionnaire Short Form (IPAQ-SF)

Developed collaboratively by an international consortium of researchers, the IPAQ Short Form has demonstrated utility in large-scale studies. Its concise format and standardized scoring provide insights into the population's physical activity patterns (5). It was adapted into Turkish in 2010 by Sağlam et al. (6). The questionnaire (short form) is based on evaluating physical activities of at least 10 minutes in the past seven days in terms of frequency, duration (in minutes), and intensity, and calculating the expended MET (Metabolic Equivalent of Task) value. 1 MET indicates the amount of oxygen a person uses while resting (3.5 ml O₂/kg/min). The questionnaire consists of four sections: vigorous physical activities, moderate-intensity physical activities, and walking. According to the IPAQ questionnaire, individuals expend 8.0 MET in "vigorous physical activities," 4.0 MET in "moderate-intensity physical activities," and 3.3 MET in "walking." In the calculation, MET values from the relevant activity category are multiplied by minutes and frequency (days) to obtain the total MET score. The multiplied values are then summed to achieve the overall physical activity value. A MET score below 600 is considered inactive, between 600-1500 is minimally active, and above 1500 is active.

Perceived Stress Scale (PSS)

Developed by Cohen et al. in 1983, and its Turkish validity and reliability adaptation was conducted by Eskin et al. in 2013 (7, 8). The PSS, comprising a total of 14 items, is designed to measure the extent to which an individual perceives certain situations as stressful. Participants assess each item on a 5-point Likert scale ranging from "Never [0]" to "Very Often [4]." Seven of the items containing positive expressions are reverse-scored. The scale comprises two factors: perceived insufficient self-efficacy (ISE) and stress/discomfort (SD). An increase in scores indicates an elevated level of perceived stress in the individual. For the Turkish version of the PSS, Cronbach's alpha values for the total scale and its two factors, ISE and SD, were calculated as 0.84, 0.81, and 0.76, respectively. In this study, the obtained alpha values were 0.79, 0.78, and 0.79 for the same scale and factors, respectively.

Emotional Eating Scale (EES)

Developed by Doğan et al. as a self-report measurement to assess emotional eating levels in adults (9). The scale consists of 14 items and utilizes a five-point Likert scale ranging from "not convenient at all [1]" to "completely convenient [5]". Higher scores indicate higher emotional eating levels. The original scale demonstrated a Cronbach's alpha value of 0.94, while this study yielded a value of 0.93.

24-hour Dietary Recall

This method gathers comprehensive food and beverage consumption information within a specific day. This structured interview captures detailed data about all consumed items, including possible dietary supplements, over the past 24 hours, often from midnight to midnight the previous day (10).

Statistical Analysis

Data presentation involved the utilization of frequency, percentage, mean, standard deviation, median, quartiles, minimum, and maximum values. Skewness and kurtosis values were examined on a scale of (-1.00 to +1.00) to assess normal distribution. Accordingly, for a non-parametric test, independent samples t-test, one-way analysis of variance (ANOVA), and LSD post hoc analyses were employed for normally distributed data. Mann Whitney U and Kruskal Wallis H tests were employed for data that did not exhibit a normal distribution. The subsequent analysis employed Dunn's test. Relationship test employed by Spearman correlation. For comparing categorical variables, Fisher's Exact, Likelihood Ratio, and Pearson's Chi-Square tests were utilized. Results were interpreted at a 95% confidence level.

RESULTS

According to the anthropometric and sociodemographic findings of the participants, 98.7% of the participants were male, 55.5% were between the ages of 40 and 49, 87.6% were married, and 51.1% had an income equal to their expenses, 57.1% had 5-14 years of driving experience, 71.3% worked more than 45 hours per week. It was determined that 85.8% were overweight or with obesity (52.6%; 33.2%, respectively), and 96.1% were inactive (Table 1).

The average age was determined to be 43.3±6.7 years, with an average weight of 88.4±13.3 kg, average height of 175.5±6.3 cm, and mean BMI value of 28.7±4.0 kg/m². The mean perceived stress scale score for participants was determined to be 25.8±6.7, while the mean emotional eating scores were found to be 29.3±10.8. Additionally, the mean MET scores were observed to be 246.2±165.4 (Table 2).

When comparing the perception of stress/discomfort and emotional eating scores based on participants' characteristics, it was observed that individuals with higher income had statistically higher scores (p=0.042) in terms of stress/discomfort perception compared to those with lower and moderate incomes. Furthermore, individuals with less than five years of experience in driving had lower scores (p<0.001) in stress/discomfort perception compared to those with five years or more. It was also determined that drivers between the ages of 50 and 67 had statistically low-

Table 1: Participants' sociodemographic and anthropometric characteristics and physical activity levels.

Variables*	Findings (n=380)
Gender	
Male	375 (98.7)
Female	5 (1.3)
Age Groups	
23-39	108 (28.4)
40-49	211 (55.5)
50-67	61 (16.1)
Marital Status	
Married	333 (87.6)
Single	47 (12.4)
Income Status	
Income less than expenses	128 (33.7)
Income equals expenses	194 (51.1)
Income more than expenses	58 (15.3)
Seniority	
Under 5 years	74 (19.5)
Between 5-14 years	217 (57.1)
15 years and above	89 (23.4)
Working time per week	
45 hours or less	109 (28.7)
Over 45 hours	271 (71.3)
BMI Groups	
Underweight (<18.5 kg/m ²)	2 (0.5)
Normal (18.5 - 25 kg/m ²)	52 (13.7)
Overweight (25 - 30 kg/m ²)	200 (52.6)
Obesity (>30 kg/m ²)	126 (33.2)
MET Classifications	
Inactive (<600)	365 (96.1)
Minimally active (600-1500)	15 (3.9)

*Data are shown as n (%); **BMI:** Body Mass Index; **MET:** Metabolic Equivalent of Task.

Table 2: Participants' age, anthropometrics, and scores from scales.

Variables*	Findings (n=380)
Age	43.3±6.7 (23.0-67.0)
Weight (kg)	88.4±13.3 (46.0-149.0)
Height (cm)	175.5±6.3 (162.0-198.0)
BMI (kg/m ²)	28.7±4.0 (14.9-48.1)
PSS General	25.8±6.7 (0.0-43.0)
EES General	29.3±10.8 (14.0-69.0)
Total MET	246.2±165.4 (51.4-1358.9)

*Data are shown as mean±standard deviation (minimum-maximum); **BMI:** Body Mass Index; **MET:** Metabolic Equivalent of Task; **PSS:** Perceived Stress Scale; **EES:** Emotional Eating Scale.

er emotional eating scores compared to those between the ages of 23 and 39 ($p=0.016$). However, no statistically significant differences were found when comparing the perceived stress and self-efficacy scores based on participants' characteristics ($p>0.05$) (Table 3).

No significant differences were observed in the distributions of participants according to gender, age groups, marital status, income status, years of driving experience, weekly working hours groups, and BMI groups based on the MET score classifications of their physical activity levels ($p>0.05$) (Table 4).

Positive weak-level relationships were found between participants' perception of stress/discomfort and their general stress level and emotional eating scores ($p<0.001$; $p=0.004$, respectively). Participants' emotional eating levels increase or decrease in the same direction as the stress/discomfort and overall perceived stress scores (Table 5).

The analysis of dietary parameters among municipal bus drivers revealed diverse consumption patterns. The mean energy intake was 1674.4 ± 429.5 kcal, and carbohydrate intake was 235.4 ± 56.2 g, with carbohydrates constituting 0.57 of total energy intake. Protein intake averaged 61.4 ± 18.5 g, comprising 0.15 of total energy intake. Fat intake averaged 55.8 ± 22.6 g, contributing to 0.29 of total energy intake. The intake of saturated fat was 16.7 ± 7.4 g, monounsaturated fat was 21.5 ± 9.9 g, polyunsaturated fat was 13.9 ± 6.8 g, and dietary fiber intake averaged 18.8 ± 5.4 g (Table 6).

DISCUSSION

The stark finding that 85.8% of municipal bus drivers are classified as overweight (52.6%) or with obesity (33.2%) calls immediate attention. This elevated prevalence underscores the pressing need for tailored interventions to improve this occupational group's health and well-being. The consistently high rate of overweight and obesity among bus drivers echoes the broader trend of increasing weight-related concerns worldwide. A study consisting of 111 Italian bus drivers finds that 58.6% of them are overweight (47.8%) or with obesity (10.8%) (11). Another study, retrospectively collecting data from medical records in Poland, states that 62.6% of truck and bus drivers were found overweight or with obesity. Of these drivers with BMI higher than 25 kg/m², 47.9% have concomitant hypertension and 54% hyperglycemia. This finding highlights the occupational tendencies to chronic diseases (12). With the participation of 527 bus drivers, a study conducted in Ghana found that 35.3% of them are overweight and 19% with obesity, in terms of BMI (13). Another study conducted with 103 bus drivers in Brazil stated that 26.3% had abdominal obesity with a mean

Table 3: Comparison of participant characteristics based on their scores from the scales.

Variables	ISE*	SD*	PSS**	EES**	
Gender					
Male (n=375)	15.6±5.2	10.2±4.3	27 (23 - 30)	28 (22 - 35)	
Female (n=5)	18.2±5.5	7.8±3.1	28 (22.5 - 28.5)	28 (18.5 - 35)	
	<i>t/z</i>	-1.119 _t	1.239 _t	-0.119 _z	-0.416 _z
	<i>p</i>	0.264	0.216	0.905	0.677
Age Groups					
23-39 _a (n=108)	15.2±4.8	10.5±3.9	26.5 (23 - 30)	29 (24 - 36)	
40-49 _b (n=211)	15.8±5.3	10.2±4.6	27 (22 - 30)	28 (21 - 35)	
50-67 _c (n=61)	15.8±5.5	9.4±4.1	27 (23 - 28)	24 (21 - 31)	
	<i>F/χ²</i>	0.510 _t	1.284 _F	1.452 _{χ²}	8.241 _{χ²}
	<i>p</i>	0.601	0.278	0.484	0.016
	<i>Post-hoc</i>				a>c
Marital Status					
Married (n=333)	15.6±5.1	10.3±4.4	27 (23 - 30)	28 (21 - 34)	
Single (n=47)	16.2±5.7	9.1±4	27 (23 - 29)	28 (25 - 36)	
	<i>t/z</i>	-0.818 _t	-1.859 _t	-0.570 _z	-0.772 _z
	<i>p</i>	0.414	0.064	0.569	0.440
Income Status					
Income less than expenses _a (n=128)	16.4±5.2	9.9±4.1	27 (23 - 30)	27.5 (23 - 35)	
Income equals expenses _b (n=194)	15.4±5.2	10.0±4.2	27 (22 - 29)	28 (21 - 34)	
Income more than expenses _c (n=58)	14.8±4.9	11.5±5.0	28 (22 - 31)	28 (21 - 34)	
	<i>F/χ²</i>	2.239 _F	3.197 _F	2.334 _{χ²}	0.372 _{χ²}
	<i>p</i>	0.108	0.042	0.311	0.830
	<i>Post-hoc</i>		c>a, b		
Seniority					
Under 5 years (n=74)	16.3±5.2	8.5±3.4	27 (21 - 29)	27 (22 - 32.3)	
Between 5-14 years (n=217)	15.5±5.1	10.6±4.3	26 (23 - 30)	29 (23 - 35.5)	
15 years and above (n=89)	15.8±5.1	10.7±4.9	28 (22 - 30)	25 (18 - 35)	
	<i>F/χ²</i>	0.926 _F	7.293 _F	2.504 _{χ²}	5.937 _{χ²}
	<i>p</i>	0.397	0.001	0.286	0.051
	<i>Post-hoc</i>		c>a		
Working time per week					
45 hours or less (n=109)	16.0±4.7	10.0±4.1	27 (23 - 29)	29 (23 - 35.5)	
Over 45 hours (n=271)	15.5±5.4	10.3±4.4	27 (23 - 30)	27 (21 - 34)	
	<i>t/z</i>	0.893 _t	-0.564 _t	-0.356 _z	-1.551 _z
	<i>p</i>	0.373	0.573	0.721	0.121
BMI Groups					
Underweight (<18.5 kg/m ²) (n=2)	20.0±2.8	9.5±2.1	29.5 (26 - .)	28 (27 -)	
Normal (18.5 - 25 kg/m ²) (n=52)	15.6±4.6	10.1±4.0	26 (22.3 - 29.8)	28 (21.3 - 41.5)	
Overweight (25 - 30 kg/m ²) (n=200)	15.9±4.9	10.0±4.3	27 (23 - 29)	28 (23 - 34)	
Obesity (>30 kg/m ²) (n=126)	15.3±5.7	10.5±4.6	27 (22 - 30.3)	27 (20 - 35)	
	<i>F/χ²</i>	0.847 _F	0.278 _F	1.204 _{χ²}	1.364 _{χ²}
	<i>p</i>	0.469	0.841	0.752	0.714
MET Classifications					
Inactive (<600) (n=365)	15.7±5.1	10.2±4.3	27 (23 - 30)	28 (22 - 35)	
Minimally active (600-1500) (n=15)	14.6±6.4	8.7±3.7	26 (15 - 28)	23 (19 - 33)	
	<i>t/z</i>	0.645 _t	1.384 _t	-1.389 _z	-1.330 _z
	<i>p</i>	0.529	0.167	0.165	0.184

*: Data are shown as mean±standard deviation; **: Data are shown as Median (25th percentile - 75th percentile) **ISE**: Insufficient self-efficacy; **SD**: Stress/Discomfort; **PSS**: Perceived Stress Scale; **EES**: Emotional Eating Scale; **t**: Independent samples t-test value; **z**: Mann Whitney U test value; **F**: one-way ANOVA test value; **χ²**: Kruskal Wallis H test value.

Table 4: Comparison of participants' MET score classifications based on characteristics.

Variables*	Inactive (n=365)	Minimally active (n=15)	p
Gender			
Male (n=375)	360 (98.6)	15 (100.0)	1.000 _a
Female (n=5)	5 (1.4)	0 (0.0)	
Age Groups			
23-39 (n=108)	102 (27.9)	6 (40.0)	0.203 _b
40-49 (n=211)	206 (56.4)	5 (33.3)	
50-67 (n=61)	57 (15.6)	4 (26.7)	
Marital Status			
Married (n=333)	319 (87.4)	14 (93.3)	0.705 _a
Single (n=47)	46 (12.6)	1 (6.7)	
Income Status			
Income less than expenses (n=128)	125 (34.2)	3 (20.0)	0.330 _c
Income equals expenses (n=194)	186 (51.0)	8 (53.3)	
Income more than expenses (n=58)	54 (14.8)	4 (26.7)	
Seniority			
Under 5 years (n=74)	71 (19.5)	3 (20.0)	0.299 _b
Between 5-14 years (n=217)	211 (57.8)	6 (40.0)	
15 years and above (n=89)	83 (22.7)	6 (40.0)	
Working time per week			
45 hours or less (n=109)	107 (29.3)	2 (13.3)	0.249 _a
Over 45 hours (n=271)	258 (30.7)	13 (86.7)	
BMI Groups			
Underweight (<18.5 kg/m ²) (n=2)	2 (0.5)	0 (0.0)	0.855 _b
Normal (18.5 - 25 kg/m ²) (n=52)	49 (13.4)	3 (20.0)	
Overweight (25 - 30 kg/m ²) (n=200)	192 (52.6)	8 (53.3)	
Obesity (>30 kg/m ²) (n=126)	122 (33.4)	4 (26.7)	

*Data are shown as n (%); **a:** Fisher Exact test; **b:** Likelihood Ratio; **c:** Pearson chi-square test.

Table 5: The relationship between participants' perceived stress levels and emotional eating.

	Emotional Eating	
	r	P
Inadequate Self-Efficacy	-0.059	0.255
Stress/Discomfort	0.281	<0.001
Perceived Stress	0.148	0.004

r: Spearman correlation.

BMI of 28±4 kg/m² (14). The situation worsens in the United States of America (USA); 91.1% of the bus drivers are found to be overweight or with obesity, with a mean BMI of 34.6±8.7 kg/m² (15). Another study in Minnesota, USA, shows similar findings, 87% of included public transit workers had excess body weight, with a mean BMI of 32.3±7.3 kg/m² (2). These higher rates could be regarding both a sed-

Table 6: Participants' energy and macronutrient intakes.

Intakes*	Findings
Energy (kcal)	1674.4±429.5 (638.1-3541.5)
Carbohydrate (g)	235.4±56.2 (127.5-525.3)
Carbohydrate (%)	0.6±0.1 (0.3-0.8)
Protein (g)	61.4±18.5 (20.0-137.1)
Protein (%)	0.2±0.0 (0.1-0.3)
Fat (g)	55.8±22.6 (7.0-148.6)
Fat (%)	0.3±0.1 (0.1-0.5)
SFA (g)	16.7±7.4 (1.8-48.9)
MUFA (g)	21.5±9.9 (2.2-65.3)
PUFA (g)	13.9±6.8 (1.1-37.0)
Dietary Fiber (g)	18.8±5.4 (7.7-37.6)

*Data are shown as mean±standard deviation (minimum-maximum); **SFA:** Saturated Fatty Acids; **MUFA:** Monounsaturated Fatty Acids; **PUFA:** Polyunsaturated Fatty Acids.

entary lifestyle and a Western-type diet. From these results, we can conclude that excess body weight among bus drivers is a solid problem globally.

The sedentary nature of their profession, characterized by prolonged periods of sitting while operating vehicles, is a salient contributor to this heightened prevalence. The scarcity of physical activity, as evidenced by the low mean MET scores (246.2 ± 165.4 ; below 600 considered inactive), compounds the health risks associated with their weight status. These results align with previous studies emphasizing the influence of sedentary behavior and low physical activity on the development of overweight and obesity, reinforcing the urgency of targeted interventions for bus drivers (16-18).

The substantial proportion (96.1%) of municipal bus drivers categorized as “inactive” underscores the formidable challenge of promoting physical activity within this profession. Although this finding is salient, considering 71.3% of the drivers work more than 45 hours per week and the nature of their occupation requires sitting, it seems unfortunately fated for public transport bus drivers. The documented link between extended sitting durations and health risks highlights the necessity for initiatives to foster physical activity during and outside work hours (19, 20).

The analysis of stress perception and emotional eating among municipal bus drivers unveiled a subtle but noteworthy connection between these psychological and dietary aspects. However, the PSS and EES scores registered within the moderate or low range, a weak positive correlation between them implies that slightly higher stress levels may relate to elevated emotional eating tendencies. This finding aligns with established literature that links stress with increased emotional eating, suggesting that stress can prompt individuals to turn to calorie-dense foods for solace (21, 22). Despite this relationship's modest nature, recognizing stress's influence on dietary behaviors remains crucial. Even when stress and emotional eating scores are moderately or lowly distributed on average, they can collectively impact eating habits.

Consequently, proactive stress management strategies tailored to the unique demands of municipal bus drivers' roles are warranted, as they can contribute to healthier coping mechanisms and counteract potential adverse effects of stress on psychological and dietary well-being. Though subtle, the weak correlation underscores these variables' interwoven nature. Future research might explore the underlying mechanisms facilitating this relationship, offering insights into drivers' perceptions of stress and its dietary implications. Addressing the intricate dynamics of stress and dietary behaviors through tailored interventions can

substantially contribute to the overall well-being of municipal bus drivers.

The dietary findings provide a comprehensive view of participants' consumption patterns, shedding light on their energy and macronutrient intake. The revealed values of energy, carbohydrates, proteins, and fats in absolute quantities and as percentages of total energy intake offer insights into their dietary habits and potential implications for health and well-being. The mean energy intake of 1674.4 kcal indicates a moderate level of energy consumption among municipal bus drivers. However, the wide range from 638.1 kcal to 3541.5 kcal highlights substantial individual variability in energy intake. Even though the mean energy intake level seems low, it contradicts the elevated prevalence levels of excess body weight among drivers. It is essential to consider that these findings rely on drivers' own statements and may be biased when interpreting these results.

Carbohydrates constitute a significant portion of the drivers' diet, with a mean intake of 235.4 grams. This value, coupled with the mean carbohydrate percentage of 0.57, reflects the prominence of carbohydrates in their daily energy intake. Although this carbohydrate intake aligns with daily recommended ranges, it may be influenced by convenience food choices, which are often rich in easily accessible carbohydrates. This aspect warrants further investigation to determine the quality and sources of carbohydrates consumed and their potential impact on drivers' health and well-being.

The mean protein intake of 61.4 grams and the mean protein percentage of 0.15 contribute substantially to daily dietary intake. This intake aligns with recommendations for protein consumption to support muscle maintenance and overall health. This dietary pattern could affect drivers' satiety and overall nutrient balance. Further analysis is required to ascertain the sources of protein and their nutritional value within their diet.

The mean fat intake of 55.8 grams and the mean fat percentage of 0.29 underscores the role of fats in their dietary regimen. However, the distribution of fat quality, particularly saturated fats, is a pivotal consideration for health outcomes. The mean intake of saturated fat at 16.7 grams warrants attention, as high consumption of saturated fats is associated with adverse cardiovascular effects, especially when considering the overweight and obesity ratios among the participants. Such wide variation, ranging from 1.8 grams to 48.9 grams, signifies disparate dietary practices among the drivers. Promoting healthier fat choices and reducing saturated fat intake could be instrumental in improving their dietary quality.

The dietary findings highlight the need for targeted interventions that address the quality and composition of municipal bus drivers' diets. While moderate energy intake suggests overall adequacy, attention to macronutrient distribution and the sources of carbohydrates, proteins, and fats is crucial. Strategies aimed at promoting balanced and nutrient-dense meals while reducing the consumption of convenience foods high in saturated fats and refined carbohydrates could significantly improve their dietary patterns. Additionally, considering the diverse range of energy intake observed, tailored interventions that cater to individual dietary needs and preferences are essential. Future research endeavors could delve deeper into the sources of nutrients, dietary behaviors, and the drivers' perspectives on their dietary choices. Qualitative investigations could provide valuable insights into the factors influencing their food selection and uncover barriers and facilitators to adopting healthier eating habits. Moreover, integrating dietary education and nutritional guidance within their workplace environment could facilitate meaningful changes in dietary behaviors and contribute to their overall health and well-being.

In Conclusion, this study underscores the urgent need for targeted interventions addressing the high prevalence of overweight and obesity among municipal bus drivers. Their profession's sedentary nature and low physical activity levels contribute to their weight-related concerns. The interplay between stress perception and emotional eating tendencies highlights the importance of psychological well-being in dietary behaviors. Diverse dietary consumption patterns reveal opportunities for improving nutrient quality. Tailored strategies, aimed at promoting physical activity, stress management, and healthier dietary choices are crucial to enhancing the health and well-being of municipal bus drivers. Municipality officials can organize workshops or education initiatives to promote a healthy lifestyle for bus drivers. By addressing these multifaceted determinants, researchers and stakeholders can work towards improving this specific occupational group's health outcomes and quality of life.

This study possesses inherent limitations; for instance, the reliance on self-reported data from bus drivers might introduce response bias. Furthermore, the cross-sectional nature of the study precludes the establishment of causal relationships. Subsequent research endeavors are warranted to delve deeper into this subject, particularly within distinct occupational cohorts.

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Author's Contributions

The corresponding author is responsible for the study idea, data collection and analyses, and articulation of the manuscript.

Conflict of Interest

I declare there is no conflict of interest in the study.

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Ethics Approval and Informed Consent

Formal authorization was obtained from the İETT Directorate General. Additionally, ethical approval was acquired from the İstanbul Okan University Ethics Committee (Date: 12.04.2023; Number: 165-10), in accordance with the Helsinki Declaration. Before their involvement, drivers were briefed on the research's objectives and ethical facets. Their participation ensued only upon obtaining written informed consent.

Peer Review Process

Extremely peer-reviewed and accepted.

REFERENCES

- Varela-Mato V, Yates T, Stensel DJ, Biddle SJH, Clemes SA. Time spent sitting during and outside working hours in bus drivers: A pilot study. *Prev Med Rep.* 2016;3:36-39.
- French SA, Harnack LJ, Toomey TL, Hannan PJ. Association between body weight, physical activity and food choices among metropolitan transit workers. *Int J Behav Nutr Phys Act.* 2007;4(1):1-12.
- Balieiro LCT, Rossato LT, Waterhouse J, Paim SL, Mota MC, Crispim CA. Nutritional status and eating habits of bus drivers during the day and night. *Chronobiol Int.* 2014;31(10):1123-1129.
- Burnatowska E, Surma S, Olszanecka-Glinianowicz M. Relationship between mental health and emotional eating during the COVID-19 pandemic: A systematic review. *Nutrients.* 2022;14(19):3989.
- Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE, Pratt M, Ekelund U, Yngve A, Sallis JF, Oja P. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc.* 2003;35(8):1381-1395.
- Saglam M, Arıkan H, Savcı S, Inal-Ince D, Bosnak-Guclu M, Karabulut E, Tokgozolu L. International physical activity questionnaire: Reliability and validity of the Turkish version. *Percept Mot Skills.* 2010;111(1):278-284.
- Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983;385-396.
- Eskin M, Harlak H, Demirkıran F, Dereboy Ç. Algılanan stres ölçeğinin Türkçeye uyarlanması: Güvenirlik ve geçerlik analizi. In: *New/Yeni Symposium Journal.* 2013:132-140.
- Doğan T, Tekin EG, Katrancıoğlu A. Feeding your feelings: A self-report measure of emotional eating. *Procedia-Social and Behavioral Sciences.* 2011;15:2074-7.

10. Dietary Assessment Primer. National Institutes of Health, National Cancer Institute. 24-hour Dietary Recall (24HR) At a Glance. (<https://dietassessmentprimer.cancer.gov/profiles/recall/>, Accessed Date:18.04.2023)
11. Rosso GL, Perotto M, Feola M, Bruno G, Caramella M. Investigating obesity among professional drivers: the high risk professional driver study. *Am J Ind Med.* 2015;58(2):212-219.
12. Marcinkiewicz A, Szosland D. Selected risk factors of diabetes mellitus among road transport drivers. *Int J Occup Med Environ Health.* 2010;23(2):175-180.
13. Anto EO, Owiredu WKBA, Adua E, Obirikorang C, Fondjo LA, Annani-Akollor ME, Acheampong E, Asamoah EA, Roberts P, Wang W, Donkor S. Prevalence and lifestyle-related risk factors of obesity and unrecognized hypertension among bus drivers in Ghana. *Heliyon.* 2020;6(1):e03147.
14. da Silva JC, Moraes MS, Martins PC, Silva DAS. Prevalence of abdominal obesity and associated lifestyle factors in bus drivers in a city in Southern Brazil. *Work.* 2020;66(3):579-585.
15. Yeary KHK, Chi X, Lensing S, Baroni H, Ferguson A, Su J, Estabrooks PA, Tate D, Linnan L. Overweight and obesity among school bus drivers in Rural Arkansas. *Prev Chronic Dis.* 2019;16:E61.
16. Silveira EA, Mendonça CR, Delpino FM, Elias Souza GV, Pereira de Souza Rosa L, de Oliveira C, Noll M. Sedentary behavior, physical inactivity, abdominal obesity and obesity in adults and older adults: A systematic review and meta-analysis. *Clin Nutr ESPEN.* 2022;50:63-73.
17. Gonzalez Ramirez G, Bolaños Muñoz L. Relationship of sedentary lifestyle with obesity and comorbidities. In: *Physical Activity and Bariatric Surgery.* Springer; 2023:3-16.
18. Beltrán-Carrillo VJ, Megías Á, González-Cutre D, Jiménez-Loaisa A. Elements behind sedentary lifestyles and unhealthy eating habits in individuals with severe obesity. *Int J Qual Stud Health Well-being.* 2022;17(1):2056967.
19. Owen N. Sedentary behavior: Understanding and influencing adults' prolonged sitting time. *Prev Med (Baltim).* 2012;55(6):535-539.
20. Paterson C, Fryer S, Stone K, Zieff G, Turner L, Stoner L. The effects of acute exposure to prolonged sitting, with and without interruption, on peripheral blood pressure among adults: A systematic review and meta-analysis. *Sports Med.* 2022;52(6):1369-1383.
21. Ling J, Zahry NR. Relationships among perceived stress, emotional eating, and dietary intake in college students: Eating self-regulation as a mediator. *Appetite.* 2021;163:105215.
22. Shen W, Long LM, Shih CH, Ludy MJ. A humanities-based explanation for the effects of emotional eating and perceived stress on food choice motives during the COVID-19 pandemic. *Nutrients.* 2020;12(9):2712.