

Research Article

Dietary Intake Pattern Associated With General and Central Obesity Among Professional Drivers of Multan, Pakistan

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Abstract

Obesity among professional drivers is a considerable issue. The study focuses on the dietary intake pattern of the professional drivers in order to assess their general and central obesity.

Methods: A cross-sectional study of 197 professional drivers was carried out for public transport and loader vehicles. Convenient sampling technique was adopted for data collection. Dietary pattern of the drivers and its association with their body mass index (BMI), and waist circumference (WC) were focused. Along with descriptive statistics and percentages, chi-square test and two-sample t-test were used to analyze the data.

Results: The mean BMI of the participants was 25.48 ($p=4.21$) Kg/m² and WC was 93.48 (11.01) cm, respectively. There is significant association between dietary pattern and obesity among the professional drivers ($\chi^2 = 7.90$, $p\text{-value} < 0.05$ for general obesity and $\chi^2 = 8.13$, $p\text{-value} < 0.01$ for central obesity). Majority of the drivers regularly eat three times a day and they eat mostly outside their home indicating one of the major factor of obesity (both general and central).

Conclusion: The study with professional drivers reveals that dietary intake behaviour is associated with obesity and the professional drivers should be careful about their dietary pattern especially while taking meals outside their homes.

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Introduction

Obesity is considered as an escalating public health issue now a day. Over the last few decades, its prevalence across any age-group of the people is well documented in all over the world.^{1,3} In the developing countries, obesity prevalence rate has three times increased. Rates for overweight among adults have jumped from 10% to 25% and for obesity from 2% to 10%.⁴ Such estimates for Pakistani adults also shows that 28.2% of women and 22.0% of men are considered to be overweight or obese. Many physical and psychological risks about health are

connected with obesity.⁵

There are some major factors like age, race, gender and low socio-economic status, poor sleep pattern, lack of physical activity and irregular and long working hours may influence the likelihood of emerging obesity.⁶⁻⁸ In the enduring research, unhealthy dietary habits include inadequate and imbalance diet also another significant factor found for getting obesity and its consequences.^{6,9,10}

Several epidemiological studies¹¹⁻¹³ for general population has been reported in Pakistan to discuss

this chronic health issue. However, in Pakistan, there is only one available study by Safdar et al.¹⁴ that reports association between obesity and pattern of diet. The matter of obesity among professionals, especially among professional drivers is also becoming very alarming now a day and should be clearly monitored. A regional study with the Pakistani drivers found that more than 50% of these professionals are either overweight or obese.¹⁵ Nonetheless, they do not take crucial covariate i.e., 'dietary pattern of the drivers' into account, posing a serious change in their body weights. Few studies in foreign literature, reported that driver's dietary habits of are usually affected due to their erratic work demands and busy schedule. Such professionals usually consume foods from restaurant with less nutrition but high calories and such inapt dietary characteristics turn these professionals exposed to obesity.^{16,17}

This research in Pakistan has therefore planned to study the dietary pattern of drivers in order to assess their general and central obesity. This concern motivates the present study.

Methods

The present study was carried out during Feb 2014 to April 2014 in Multan city, located at the central region of Pakistan's map. The complete sampling scheme details about data collection and sample size has been described in earlier studies.^{8,15} This study includes 197 professional drivers aged between 18-68 years. A driver having any physical disability or having less than one-year professional experience was excluded from the study. Departmental ethics committee of Bahaiddin Zakariya University, Multan approved this study.

Data collection activity of this study was completed through well-trained data collection team and the required information from the drivers were taken through self-administered questionnaire. Data about socio-demographic and profession related variables i.e., age (years), marital status, educational level, monthly income and vehicle type and driving hours etc., respectively; were recorded in first section of the questionnaire. In section second, some questions related to dietary pattern were asking, i.e., number of meals intake per day and frequent place for taking breakfast, lunch and dinner. While as, the measure-

ment section contained the information about the anthropometric measurements.

Height (in inches) and weight (in kg) of each driver was taken with light clothing and without shoes by using standard protocols. For assessing the general obesity, body mass index (BMI) was used, computed as (Kg/meter^2). A driver was categorized to be overweight if $25 > \text{BMI}$ and obese if $\text{BMI} \geq 30$. While for assessing the central obesity of drivers, waist circumference (WC) cut-off suggested for metabolic complication risks were used. A driver is considered to be at increased and highly increased risk of metabolic complications if $94 < \text{WC} < 102$ cm and $\text{WC} \geq 102$ cm, respectively.^{18,19}

Descriptive statistics i.e. frequency along with their percentage of each categorical variable and mean and standard deviation (SD) of each quantitative variable were calculated. The associations between categorical variables and the mean difference of different anthropometric measurements were checked by mean of Chi-square and Two-sample t-test, respectively. Statistical software "SPSS", version 16.0 was used for all statistical analysis.

Results

The general characteristics of the participated drivers were presented in Table 1. A total of 197 drivers (61.4% public transport vehicle and 38.6% loader vehicle) aged 18-68 years were included in the study. Mostly (93.4%) drivers were married and about half (48.7%) were illiterate. The mean age, BMI and WC of the total drivers were $36.53 (\pm 10.46)$ years, $25.48 (\pm 4.21 \text{ Kg}/\text{m}^2)$ and $93.48 (\pm 11.01)$ cm, respectively. Overweight and obesity prevalence in all participants were 54.3% and 11.2%, respectively. About half (47.7%) of the professional drivers are reported to have increased risk of metabolic complications (i.e., $\text{WC} \geq 94$ cm). Results also revealed that general (29.4%) and abdominal (7.6%) obesity was more prevalent among the drivers in 26-35 years age group.

Table 2 described the relationship between vehicle type and dietary intake characteristics with general and central obesity of all drivers. Among the variables analyzed, results revealed that both vehicle type and the frequencies (2 or 3 times) of meal taken per day, respectively were significantly associated with

Table 1: Summary Statistics About the Participants (n=197)

Characteristics	n (%)
<i>Marital Status</i>	
Married	184 (93.4)
Unmarried	13 (6.6)
<i>Age-Group (years)</i>	
	mean $\pm$ S.D; 36.53 $\pm$ 10.46
15-25	29 (14.7)
26-35	76 (38.6)
36-45	56 (28.4)
45+	36 (18.3)
<i>Type of Vehicle Driving</i>	
Mini Bus	63 (32.0)
Bus	58 (29.4)
Truck	71 (36.0)
Trollers	05 (2.5)
<i>Vehicle Status</i>	
Loader Vehicle	76 (38.6)
Public Transport Vehicle	121 (61.4)
<i>Educational Level</i>	
Primary	33 (16.8)
Middle	39 (19.8)
Secondary	19 (9.6)
Higher Secondary	10 (5.1)
Illiterate	96 (48.7)
<i>Duration of Driving (years)</i>	
	mean $\pm$ S.D; 14.59 $\pm$ 9.4
5 years or less	39 (19.8)
06-15	75 (38.1)
16-25	54 (27.4)
25+	29 (14.7)
<i>BMI Categories (kg$\times$ m⁻²)*</i>	
	mean $\pm$ S.D; 25.48 $\pm$ 4.21
Normal	68 (34.5)
Overweight	107 (54.3)
Obese	22 (11.2)
<i>WC Categories (cm) **</i>	
	mean $\pm$ S.D; 93.48 $\pm$ 11.01
Normal	103 (52.3)
Increased Risk	54 (27.4)
Highly Increased Risk	40 (20.3)

* Normal if 18<BMI< 25 Kg/m²; Overweight if 25< BMI< 30 Kg/m²; Obese if: BMI $\geq$ 30 Kg/m².

**Normal if WC< 94 cm; Increased risk if 94 WC< 102; Highly increased risk if WC $\geq$ 102 cm.

general obesity (Chi-Square = 5.72, p-value $\leq$ 0.05 and Chi-Square = 7.90, p-value < 0.05, respectively) and central obesity (Chi-Square= 9.41, p-value < 0.01 and Chi-Square= 8.13, p-value < 0.01, respectively). Significance of the same pattern was also found for different meal-taking (breakfast/lunch/dinner) status of the professional drivers. More than half (66.49%) of the professional drivers were taking their meals thrice a day. Among these drivers, 65.65% (86/131) were overweight or obese and 14.50% (19/131) were at increased risk of metabolic complications (i.e., WC

$\geq$ 102). Among the said drives, very little percentages of drivers for not taking their breakfast, lunch and dinner, were observed. However, 53.30%, 69.10%, and 48.80% of the professional drivers were noted for dining outside home (at hotels/restaurants) for breakfast, lunch and dinner, respectively. These observations reflected their job nature as they had to live outside during driving hours.

Mean comparison of BMI and WC according to frequency of meal taken per day was displayed in table 3. Results revealed that mean of BMI was not significantly (p-value > 0.05) different for the drivers taking their meals twice and thrice a day. However, the mean WC was significantly high (i.e., Two times/day vs. Three times/day, respectively; 97.83 $\pm$ 1.33 vs. 91.30 $\pm$ 0.92, respectively) for the drivers, having their meals twice a day.

Discussion

Schedule working hours, adequate dietary pattern and proper sleep, all make up healthy habits for professionals workers. Unfortunately, all these characteristics are not very common among transit professionals particularly among drivers in Pakistan because of their erratic work demands and busy schedule. Moreover, majority of drivers are illiterate and have no knowledge about their healthy diet plan. In Pakistan, this was the first study in driver's community to see the relationship between dietary intake patterns with obesity. We therefore, try to compare our results with foreign research.

In our study, overweight and obesity prevalence among drivers was found to be 54.3% and 11.2%, respectively which ratifies that obesity in this community is a serious health problem. Our study results are in line with Indian's drivers study, showed 43.3% of drivers were either overweight or obese.²⁰ Some more previous studies²¹⁻²⁵ with drivers of different countries also reported the same results.

When eating habits are focused, the professional drivers usually do not act upon healthy eating habits as they frequently take their foods from restaurant or hotel, during routes of travel and meals outside home, having a high calories and low nutritional which may turn this occupational community to general or central obesity. In our study, the dietary pattern, in terms of food intake per day, was significantly associated with the general and central obesity. The results of many other studies²⁶⁻²⁸ for general

Table 2: Association Between Dietary Pattern and Obesity (n = 197)

	General obesity			Central obesity	
Subject Distribution	Normal <i>n</i> (% ⁺)	Overweight <i>n</i> (% ⁺)	Obese <i>n</i> (% ⁺)	<i>WC</i> ≥102 <i>n</i> (% ⁺)	<i>WC</i> <102 <i>n</i> (% ⁺)
	68 (34.5)	107 (54.3)	22 (11.2)	40 (20.3)	157 (79.7)
<i>Vehicle Type</i>					
Loader vehicle(<i>n</i> =76)	34 (17.2)	35 (17.8)	07 (3.6)	07 (3.6)	69 (35.0)
Public transport vehicle (<i>n</i> =121)	34 (17.3)	72 (36.5)	15 (7.6)	33 (16.7)	88 (44.7)
Chi-Square = 5.72	p-value=0.05			Chi-Square= 9.41	p-value=0.00
<i>Meals taken per day</i>					
2 time p/day (<i>n</i> = 66)	23 (11.7)	30 (15.2)	13 (6.6)	21 (10.7)	45 (22.8)
3 time p/day(<i>n</i> = 131)	45 (22.8)	77 (39.1)	09 (4.6)	19 (9.6)	112 (56.9)
Chi-Square = 7.90	p-value=0.01			Chi-Square=8.13	p-value=0.00
<i>Breakfast taking status</i>					
No eating breakfast(<i>n</i> = 07)	03 (1.5)	02 (1.0)	02 (1.0)	02 (1.0)	05 (3.6)
Home(<i>n</i> = 85)	20 (10.2)	52 (26.4)	13 (6.6)	24 (12.2)	61 (31.0)
Restaurant/Hotel(<i>n</i> = 105)	45 (22.8)	53 (26.9)	07 (3.6)	14 (7.1)	91 (46.2)
Chi-Square=12.20	p-value=0.01			Chi-Square=6.75	p-value=0.03
<i>Lunch taking status</i>					
No eating lunch(<i>n</i> = 43)	11 (5.6)	25 (12.7)	07 (3.6)	13 (6.6)	30 (15.2)
Home(<i>n</i> = 18)	05 (2.5)	08 (4.1)	05 (2.5)	06 (3.0)	12 (6.1)
Restaurant/Hotel(<i>n</i> = 136)	52 (26.4)	74 (37.6)	10 (5.1)	21 (10.7)	115 (58.4)
Chi-Square = 9.44	p-value=0.05			Chi-Square=6.49	p-value=0.03
<i>Dinner taking status</i>					
No eating dinner(<i>n</i> = 19)	11 (5.6)	04 (2.0)	04 (2.0)	08 (4.1)	11 (5.6)
Home(<i>n</i> = 82)	17 (8.6)	56 (28.4)	09 (4.6)	19 (9.6)	63 (32.0)
Restaurant/Hotel(<i>n</i> = 96)	40 (20.3)	47 (23.9)	09 (4.6)	13 (6.6)	83 (42.1)
Chi-Square =18.21	p-value=0.00			Chi-Square=8.71	p-value=0.01

* (%) Percentages out of total (197)

Table 3: Comparison of Obesity Measurements w.r.t. Dietary Pattern

	Frequency of meal	Mean	SE	t-statistic	d.f	p-value [*]
BMI (kg/m²)	Two times/day (n = 66)	25.69	0.57	0.49	195	0.62
	Three times/day (n = 131)	25.38	0.34			
WC (cm)	Two times/day (n = 66)	97.83	1.33	4.08	195	0.00
	Three times/day (n = 131)	91.30	0.92			

*p-value by two-sample independent t-test.

population not specifically for drivers were very similar with our findings. These results were also consistent with many earlier reported studies^{27,29} about general public and professionals. Moreover, the dietary pattern showed that the professional drivers, eating meals twice a day had more risk of central obesity as compared to those who used to consume meals thrice a day. For a two-time meal schedule, some heavy and unbalanced food stuff are more likely to be consumed that may become a prime cause for central obesity.

Conclusion

In conclusion, our study with professional drivers reveals that dietary intake behaviour is associated with obesity and driver's need some serious attention about their dietary behaviour especially while dining outside their homes, because this may be a chief cause to have undesired weight gain and had a risk of metabolic complications. Furthermore, some programs should also be launched for the awareness of these professionals to promote lifestyle changes and to reduce the prevalence of obesity.

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Conflict of Interest: None

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References

- Giugliano R and Carneiro EC. Factors associated with obesity in school children. *J Pediatr. (Rio J)*. 2004 Feb; 80 (1): 17-22.
- Wilson P, Meara S, Summerbell C and Kelly S. The prevention and treatment of childhood obesity. *Quality Safe Health Care*. 2003 Feb 1; 12 (1): 65-74.
- Chinn S and Rona RJ. International definitions of overweight and obesity for children: a lasting solution? *Ann Hum Biol*. 2002 Jan 1; 29 (3):306-313.
- Hossain P, Kavar B and EI Nahas M. Obesity and diabetes in the developing world-a growing challenge. *N Engl J Med*. 2007 Jan 18; 356 (3):213-215.
- Jafar TH, Chaturvedi N, Pappas G. Prevalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population. *Can Med Assoc J*. 2006 Oct 24; 175(9):1071-7.
- James PT, Leach R, Kalamara E and Shayeghi M. The worldwide obesity epidemic. *Obes Res*. 2001; 9: S228-233.
- Ko GT, Chan JC, Chan AW, Wong PT, Hui SS, Tong SD, Ng SM, Chow F, Chan CL. Association between sleeping hours, working hours and obesity in Hong Kong Chinese: the 'better health for better Hong Kong' health promotion campaign. *Int J Obes*. 2007 Feb 1; 31(2): 254-60.
- Asif M, Aslam M, Altaf S. Long Working Hours and Short Sleep Associated with Obesity among Professional Drivers and Conductors. *Ann King Edward Med Univ*. 2017 Jun 9; 23(2): 145-51.
- Prentice AM. Overeating: the health risks. *Obesity research*. 2001 Nov 1; 9(S11):234S-8S.
- Goran MI. Energy metabolism and obesity. *Med Clin North Am*. 2000 Mar 1; 84(2):347-62.
- Afridi AK and Khan A. Prevalence and etiology of obesity-an overview. *Pak J Nutr*. 2004; 3 (1): 14-25.
- Aslam M, Saeed A, Pasha GR and Altaf S. Gender differences of body mass index in adults of Pakistan: A caste study of Multan city. *Pak J Nutr*. 2010; 9 (2): 162-166.
- Dennis B, Aziz K, She L, Faruqi AMA, Davis CE, Manolio T, Burke G and Aziz S. High rates of obesity and cardiovascular disease risk factors in lower middle class community in Pakistan: the metroville health study. *J Pak Med Assoc*. 2006; 56 (6):267-72.
- Safdar NF, Bertone-Johnson E, Cordeiro L, Jafar TH and Cohen NL. Dietary patterns of Pakistani adults and their associations with socio-demographic, anthropometric and life-style factors. *J Nutr Sci*. 2013 Jan; 2.
- Aslam M, Asif M and Altaf S. Obesity; Prevalence among drivers and conductors in Multan, Pakistan. *Professional Med J*. 2015 Nov 1; 22 (7): 859-864.
- Ragland DR, Winklebsy MA, Schwalbe J, Holkman BL, Morse L, and Syme L et al. Prevalence of hypertension in bus drivers. *Int J Epidemiol* 1987 Jun 1; 16(2): 208-214.
- Talbot E, Helmkamp J and Mathews K. Occupational noise exposure, noise induced hearing loss, and epidemiology of high blood pressure. *Am J Epidemiol* 1985 Apr 1; 121 (4): 501-514.
- World Health Organization. Waist Circumference and Waist-Hip Ratio: Report of a WHO Expert Consultation. 2008. Geneva.
- Lean ME, Han TS and Morrison CE. Waist circumference as a measure for indicating need for weight management. *Brit Med J*. 1995 Jul 15; 311 (6998):158-61.
- Joshi BA, Joshi AV, Katti SM, Mallapur MD, Karikatti SS. A cross-sectional study of prevalence of overweight and obesity among bus drivers and conductors of North-West Karnataka Road Transport Corporation (NWKRTC) in Belgaum division, Belgaum. *J Ind Med Assoc*. 2013 Mar; 111 (3): 157-159.
- Izadi N, Malek M, Aminian O, Saraei M. Medical risk factors of diabetes mellitus among professional drivers. *Journal of Diabetes and Metabolic Disorders*. 2013 Jun 1; 12 (1): 23.
- Saberi HR, Morawejji AR, Fakharian E, Kashani MM and Dehdashti AR. Prevalence of metabolic syndrome in bus and truck drivers in Kashan, Iran. *Diabetol and Metab Syndr*. 2011 May 19; 3 (1): 8.
- Marcinkiewicz A, Szosland D. Selected risk factors of diabetes mellitus among road transport drivers. *Int J Occup Med Environ Health*. 2010 Jan 1; 23 (2):175-180.
- Cavagioni LC and Pierin AMG. Hypertension and obesity among professional drivers who work transporting loads. *Acta Paul Enferm*. 2010; 23 (4): 455-60.
- Siedlecka J. Selected work-related health problems in drivers of public transport vehicles. *Med Pr*. 2006; 57(1):47-52.
- Jackson M, Walker S, Cruickshan JK, Sharma S, Cade J, and Mbanya JC, et al. Diet and overweight and obesity in populations of African origin; Cameroon, Jamaica and the UK. *Pub Health Nutr*. 2007 Feb; 10(2): 122-30.
- Ventura EE, Davis JN Alexander KE, Shaibi GQ, Lee W and Byrd-Williamson CE et al. Dietary intake and the metabolic syndrome in overweight Latino children. *J Am Diet Assoc* 2008 Aug; 108 (8): 1355-9.
- Azadbakht L and Exmaillzadeh A. Dietary and non-dietary determinants of central adiposity among Tehrani women. *Pub Health Nutr* 2008 May; 11 (5): 528-34.
- Nmor J, Nwaka KH and Nmor JC. Eating behaviour of university students in Southern Nigeria: An evaluation of sex differences. *Sci J Pub Health* 2014; 2:23-37.