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Original Research Article

A CROSS-SECTIONAL STUDY ON EXPLORING THE ASSOCIATION BETWEEN LIFESTYLE BEHAVIOURS AND OBESITY IN BANK EMPLOYEES IN A TOWN OF ANDHRA PRADESH

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ABSTRACT

Background: Obesity is a critical public health issue of worldwide importance and represents a significant medical and financial challenge for the government.[1,2] The existence of an 'obesogenic environment,' characterised by easy access to unhealthy food and limited recreational options, may have contributed to the rise in obesity rates. **Objectives:** 1) To describe the socio-demographic profile of bank employees in Tirupati. 2) To determine the prevalence of obesity among bank employees in Tirupati. 3) To find out the association of pertinent risk factors associated with obesity.
Materials and Methods: Study Design: Cross-sectional Observational study. **Study area:** Department of Community Medicine & government, private and co-operative banks in Tirupati. **Study Period:** November 2020 to June 2021**. Study population:** Bank employees from government, private and co-operative banks in Tirupati were selected as per the sample size requirement. **Sample size:** The study consisted of a total of 320 cases. **Sampling Technique:** Stratified proportionate random sampling technique.
Results: The prevalence of overweight (53.3%) and obesity (16.5%) is higher among those who are married compared to the prevalence of overweight (23.1%) and obesity (9.2%) among those who are unmarried. The differences are also statistically significant (P <0.001; S). The prevalence of obesity was found to be higher in those with a family history of obesity (33.3%) compared to those without a family history of obesity (10.2%). The differences are also highly statistically significant (P<0.001; S).
Conclusion: Based on the current study, it can be deduced that there is a notably high incidence of generalised obesity among bank employees. The significant risk factors linked to obesity included age, job level, marital status, family history of obesity, physical activity levels, and frequent consumption of fried foods.
Keywords: Lifestyle Behaviours, bank employees, Body mass index, unhealthy food.

INTRODUCTION

Obesity is a critical public health issue of worldwide importance and represents a significant medical and financial challenge for the government.[1,2] The existence of an 'obesogenic environment,' characterised by easy access to unhealthy food and limited recreational options, may have contributed to the rise in obesity rates. In addition to environmental factors, obesity is shaped by a variety

of other influences, making it a complex problem that can lead to various serious health conditions.[3]

Obesity is characterised by the World Health Organization (WHO) as an abnormal or excessive accumulation of fat that can have detrimental effects on health.4 For an individual, obesity typically arises from a surplus of calories consumed compared to those expended. A greater intake of calorie-dense foods, without a corresponding rise in physical activity, results in weight gain. In India, central obesity is a significant risk factor for cardiovascular diseases (CVDs).[2]

Body mass index (BMI) is a straightforward measure of weight relative to height that is frequently utilised to categorise overweight and obesity in adults. BMI is calculated as "a person's weight in kilograms divided by the square of their height in meters (kg/m2)". According to the World Health Organization (WHO), adults are classified as overweight when their BMI is 25 kg/m2 or higher and obese when their BMI reaches 30 kg/m2. For the Asian population, the thresholds for overweight and obesity are set at ≥23.0 kg/m2 and ≥25.0 kg/m2, respectively.[2,5]

Waist circumference (WC) is regarded as the preferred indicator of abdominal obesity.[6] The waist-to-hip ratio is another metric used to assess abdominal fat. A waist circumference exceeding 102 cm in men and 88 cm in women is the benchmark for identifying abdominal obesity. Additionally, a waist-hip ratio greater than 1.0 for males and more than 0.85 for females is used to evaluate central obesity.[7]

The various elements linked to obesity include age, gender, genetic predispositions, insufficient physical activity, socioeconomic background, dietary patterns, psychological factors, family history, hormonal influences, alcohol consumption, education level, smoking habits, ethnicity, and substance abuse. A primary contributor to weight gain has been a decrease in physical activity levels.[8]

Both overweight and obesity significantly increase the risk of non-communicable diseases, which include cardiovascular conditions such as heart disease and stroke, diabetes, musculoskeletal disorders like osteoarthritis, and certain types of cancer, including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon4 cancers. In terms of deaths attributed to metabolic risk factors globally, elevated blood pressure is the leading cause, accounting for 19% of deaths worldwide, followed by obesity and overweight, as well as elevated blood glucose levels.[9] Approximately 2.8 million deaths are linked to being overweight or obese.2 According to the World Health Organization (WHO), global data indicate that the prevalence of obesity has nearly tripled globally from 1975 to 2016. As of 2016, 1.9 billion adults aged 18 and older (39%) were classified as overweight, while 650 million adults (13%) were considered obese.[4]

The swift adoption of Western lifestyles and sedentary habits in developing nations is rapidly increasing, contributing significantly to the higher rates of obesity. As per the 2015 ICMR-INDIAB study, the rates of obesity and central obesity in India range from 11.8% to 31.3% and 16.9% to 36.3%, respectively. In Andhra Pradesh, the NFHS-4 (2015-2016) report indicates that the rates of obesity among males and females are 33.5% and 33.2%, respectively. The NFHS-5 (2019-2020) report reveals that obesity rates among men and women are 31.1% and 36.3%, respectively.[10]

The current research was initiated due to the scarcity of studies focused on obesity among bank employees in this region. Bank employees typically embody individuals with sedentary habits, in addition to experiencing psychological stress resulting from financial dealings.

Aim: To determine the prevalence and analyse the risk factors influencing obesity among bank employees in Tirupati.

Objectives:

1. To describe the socio-demographic profile of bank employees in Tirupati.
2. To determine the prevalence of obesity among bank employees in Tirupati.
3. To find out the association of pertinent risk factors associated with obesity.

MATERIALS AND METHODS

Study Design: Cross-sectional Observational study.

Study area: Department of Community Medicine & government, private and co-operative banks in Tirupati.

Study Period: November 2020 to June 2021.

Study population: Bank employees from government, private and co-operative banks in Tirupati were selected as per the sample size requirement.

Sample size: The study consisted of a total of 320 cases.

Sampling Technique: Stratified proportionate random sampling technique.

Inclusion Criteria

- Employees working in government, private and cooperative banks of Tirupati were selected as per the sampling technique described above (Stratified proportionate Random Sampling Technique).
- Employees who have given consent and are willing to participate in the study.

Exclusion Criteria

- Pregnant women, women who were under oral contraceptive pills, and individuals on therapy with steroids and anti-depressants
- Bank employees who could not be contacted even after three visits to the bank.

Ethical consideration: Institutional Ethical committee permission & and permission were obtained from the various regional bank managers

or managers taken before the commencement of the study.

Study tools and Data collection procedure

A stratified random sampling technique was used to select study participants from banks in the Tirupati urban division, categorised into government, private, and cooperative sectors. The sampling frame included 665 employees: 500 from government banks, 140 from private banks, and 25 from cooperative banks. Based on the proportion of employees in each sector (75% government, 21% private, 4% cooperative), 232 government, 74 private, and 14 cooperative bank employees were selected. Five employees were randomly chosen from each of the 53 government, 15 privates, and three cooperative banks. Written consent was obtained, and if an employee was unavailable, a replacement was selected. A pilot study in October 2020 tested the questionnaire and ensured feasibility.

The study participants were interviewed using a pretested schedule covering

1. **Socio-demographic data:** Age, gender, religion, education, income, marital status, etc.
2. **Physical activity:** Assessed using the Global Physical Activity Questionnaire (GPAQ), categorised into active or insufficiently active based on MET minutes.
3. **Diet pattern:** Type of diet, oil used, and consumption of foods like fried items, fruits, and bakery products.
4. **Lifestyle factors:** Alcohol, smoking, sleep, screen time, meditation, and yoga.
5. **Work-related stress:** Evaluated using a 5-point Likert scale, with scores ≤20 indicating stress.
6. **Health profile:** Family history of obesity, diabetes, hypertension, and drug history.
7. **Anthropometric measurements:** Weight, height, BMI (classified by WHO), waist circumference, and hip circumference were measured using standardised methods.

Data was collected, cleaned, and analysed to assess health and lifestyle patterns among participants.

Statistical Analysis

Data collected was entered into Excel and analysed using Epi Info 7.2.2.6. Socio-demographic data, physical activity, eating habits, lifestyle factors (alcohol, tobacco, sleep, meditation, yoga), stress, medical history (diabetes, hypertension), and family history are presented as frequencies and percentages. Prevalence of normal weight, overweight, and obesity (generalised, abdominal, central) is also shown in frequencies and percentages. Age, height, weight, waist circumference, and waist-hip ratio are presented as mean and standard deviation. A chi-square test was used to assess the association of obesity with socio-demographic and risk factors, with significance set at $p < 0.05$.

RESULTS

Table 1: Age & gender distribution of the study participants (N=320)

S.No		Variable	No. of subjects	Percentage
1		**Age group (Years)**		
	(a)	Less than 30	71	22.2
	(b)	30 – 39	125	39.1
	(c)	40 – 49	67	20.9
	(d)	50 & above	57	17.8
2		**Gender**		
	(a)	Male	230	71.9
	(b)	Female	90	28.1

The majority of the study participants belong to the 30-39 years age group (39.1%), followed by the less than 30 years group (22.2%). A large majority of the subjects were males (71.9%).

Most of the study subjects are residing in urban areas (88.1%). A large majority of them belong to the Hindu religion (96.2%).

A comparatively higher proportion of subjects are officers by designation (50.3%), followed by clerks (28.8%). The majority of the subjects are graduates as per educational status (61.9%), while 38.1% are postgraduates.

The majority of the subjects are residing in nuclear families (81.2%), followed by three-generation families (14.1%). In terms of marital status, 79.7% are married.

Table 2: Prevalence of Overweight & Obesity (based on BMI)

Nutritional Status (BMI level)	No. of Subjects	Percentage
Normal (18.5 – 24.99)	105	32.8
Overweight (24.99 – 29.99)	167	52.2
Obesity (30 &	48	15.0

above)		
TOTAL	**320**	**100.0**

The prevalence of overweight was found to be 52.2%, and that of obesity was found to be 15.0% among the study subjects.

Table 3: Physical activity & grading among study participants

Physical activity	No. of subjects	Percentage
Work – vigorous-intensity activities	5	1.6
Work – moderate-intensity activities	31	9.7
Travel to and from places (by walking or using a bicycle)	68	21.3
Recreational activities – Vigorous	24	7.5
Recreational activities – Moderate	79	24.7

It was found that the proportion of vigorously intensive work and moderately intensive work were 1.6% and 9.7%, respectively. Thus, only 11.3% of subjects were engaged in moderate or vigorous intensive work activities. Travel from place to place by walking or by bicycle was found in only 21.3% of subjects. The subjects were engaged in vigorous recreational activities in only 7.5% and moderate recreational activities in 24.7% of cases. It was found that only 23.8% were sufficiently active, while the remaining 76.2% were physically inactive. Most of the subjects are Non-vegetarian (75.6%) by type of diet. The frequency of consumption of Non-Vegetarian items is three more times in 23.8% of cases. Most of the subjects were using oils predominantly rich in Poly Unsaturated Fatty Acids (57.8%), while oils rich in Mono Unsaturated Fatty Acids were used by 37.2%.

Table 4: Work-related Stress among study subjects (N=320)

Work-related stress	No. of subjects	Percentage
Present (Score up to 20)	201	62.8
Absent (Score more than 20)	119	37.2
Total	**320**	**100.0**

A combined score was calculated based on responses to questions (on the Likert scale) related to work stress, and those with a score of 20 or less are classified as the presence of work stress. It was found that overall, 62.8% had work-related stress.

Table 5: Prevalence of overweight and obesity by age group of study subjects (N=320)

Age group (Years)	No. of Study subjects	Nutritional Status based on BMI		
		Normal (%)	Overweight (%)	Obesity (%)
Less than 30	71 (100.0)	45 (63.4)	21 (29.6)	5 (7.0)
30 – 39	125 (100.0)	39 (31.2)	67 (53.6)	19 (15.2)
40 – 49	67 (100.0)	14 (20.9)	44 (65.7)	9 (13.4)
50 & above	57 (100.0)	7 (12.3)	35 (61.4)	15 (26.3)
Total	**320 (100.0)**	**105 (32.8)**	**167 (52.2)**	**48 (15.0)**

$\chi 2 = 48.7$; df =6; P < 0.001; Significant

The prevalence of obesity was found to be highest in the 50 & above years age group (26.3%), followed by the 30-39 years group (15.2%). The prevalence of overweight (29.6%) and obesity (7.0%) were found to be lowest in less than 30 years age group. The differences were also found to be highly statistically significant (P<0.001; S).

The prevalence of overweight is exactly similar in male and female study subjects (52.2%), but the prevalence of obesity was found to be higher in males (17.0%) compared to that in females (10.0%). However, the differences are not statistically significant. (P=0.22; NS).

The prevalence of obesity was found to be higher in the manager group (19.4%) compared to the officers group (16.7%) and clerk groups (8.7%). The differences are also statistically significant (P<0.001; S).

Table 6: Prevalence of overweight and obesity by marital status among study subjects (N=320)

Marital status	No. of Study subjects	Nutritional status based on BMI		
		Normal (%)	Overweight (%)	Obesity (%)
Unmarried	65 (100.0)	44 (67.7)	15 (23.1)	6 (9.2)
Married	255 (100.0)	77 (30.2)	136 (53.3)	42 (16.5)
Total	**320 (100.0)**	**121 (37.8)**	**151 (47.2)**	**48 (15.0)**

$\chi 2 = 31.1$; df=2; P <0.001; S

The prevalence of overweight (53.3%) and obesity (16.5%) is higher among those who are married compared to the prevalence of overweight (23.1%) and obesity (9.2%) among those who are unmarried. The differences are also statistically significant (P <0.001; S).

Table 7: Prevalence of overweight and obesity by grade of physical activity among study subjects (N=320)

Grade of Physical Activity	No. of Study subjects	Nutritional Status based on BMI		
		Normal (%)	Overweight (%)	Obesity (%)
Sufficiently active	76 (100.0)	36 (47.4)	33 (43.4)	7 (9.2)
Inactive	244 (100.0)	69 (28.3)	134 (54.9)	41 (16.8)
Total	**320** (100.0)	**105 (32.8)**	**167 (52.2)**	**48 (15.0)**

The prevalence of obesity was found to be comparatively higher in those who are physically inactive (16.8%) compared to those who are sufficiently active (9.2%). The differences are also highly statistically significant (P=0.0063; S)

The prevalence of overweight is higher among non-vegetarians (54.2%) compared to vegetarians (46.2%), but the prevalence of obesity is higher among vegetarians (17.9%) compared to non-vegetarians (14.0%). However, the differences are not statistically significant (P =0.446; NS).

It was found that the prevalence of obesity was found to be higher in those consuming fried foods regularly (more than 3 times per week) (19.9%) compared to those who are not consuming fried foods regularly (10.4%). The differences are also statistically significant (P=0.018; S).

Table 8: Prevalence of overweight and obesity by family history of obesity among study subjects (N=320)

Family history of obesity	No. of Study subjects	Nutritional Status based on BMI		
		Normal (%)	Overweight (%)	Obesity (%)
Yes	66 (100.0)	16 (24.2)	28 (42.5)	22 (33.3)
No	254 (100.0)	89 (35.0)	139 (54.8)	26 (10.2)
Total	**320** (100.0)	**105 (32.8)**	**167 (52.2)**	**48 (15.0)**

$\chi 2 = 22.0$; df=2; P <0.001; S

The prevalence of obesity was found to be higher in those with a family history of obesity (33.3%) compared to those without a family history of obesity (10.2%). The differences are also highly statistically significant (P<0.001; S).

The prevalence of obesity was found to be higher in those who currently sleep less than 6 hours per day (18.2%) compared to those with adequate sleep (13.6%). However, the differences are not statistically significant (P=0.38; NS).

The prevalence of obesity is found to be higher in those with work stress (16.4%) compared to those without work-related stress (12.6%). However, the differences are not statistically significant (P=0.63; NS).

DISCUSSIONS

In the present study, the majority of the study participants belonged to the 30-39 years age group (39.1%), followed by the less than 30 years group (22.2%). A study conducted by Shah et al,[12] among bank employees of Ahmedabad City (2021) also reported that the majority of participants (70.7%) were under the age of 40 years. A study conducted by Aparna et al,[13] among bank employees in Vadodara city also (2014) reported that the majority of the study participants (69%) belonged to the age range of 26-35 years. Thus, the present study findings agree with other similar studies.

In the present study, the majority of the subjects were males (71.9%). A similar observation was made in a study conducted by Kulkarni et al,[14] among bank employees in Latur City of Maharastra (2019), where it was found that the majority (87.8%) of the subjects were males. A study conducted by Dixit et al,[15] among bank employees of the Mangalore region (2020) also reported a similar observation, with 58.3% of the participants being males. Aparna et al,[13] study among bank employees of urban Vadodara ((2014) also revealed that 75.8% were males. Thus, the present study findings agree with most other similar studies.

In this study, the majority of the participants were officers (50.3%), while 28.8% of the participants were clerks, and 20.9% were managers. Similar observations were made in a study conducted by Ganesh Kumar et al,[16] which also reported that most of the employees were clerks (63%) while 28.1% were officers and 8.9% were managers. A study conducted by Shah et al,[12] however, reported that 43.2% were managers and officers, and 42.2% of the participants were clerks. In Dixit et al,[15] studies, it was found that 41.1% were officers, 30.0% were managers, and 29.0% were clerks. The differences in the designation between the present study and other studies may be due to different policies of recruitment and promotion of banks and public sector undertakings.

In the current study, the majority of the participants (81.2%) belonged to a nuclear family, followed by 14.1% to a three-generation family, while 4.7% were from a joint family. In Kumar et al,[16] study, 65% were living in a nuclear family and 35% in a joint family. A study conducted by Brahmankar et al,[17] reported that 74.4% were living in a nuclear family, followed by 24.4% in a joint family and 1.2% in three-generation families. The finding in the present, as well as other studies that most participants belong to nuclear families, may be attributed to the general well-known evolution of nuclear families in the Indian urban populations.

In the present study, the majority of the study participants were married (79.7%). Similar findings were found in Dixit et al,[15] study, with 75.9% of subjects being married. A study conducted by

Brahmankar et al,[17] also reported that 92.2% were married. In Kumar et al. 37 studies also, it was found that 95% were married. Thus, the present study findings agree with other studies.

In the present study (which used the WHO International Classification), the prevalence of overweight was found to be 52.2%, and that of obesity was found to be 15.0% among the study participants. A cross-sectional study conducted by Montazerifar et al,[18] reported that the prevalence of overweight was 49.1% and obesity was 10.3%, which is almost similar to the present study. A cross-sectional study conducted by Addo et al,[19] reported that the prevalence of overweight was 37.8% and obesity was 17.8%, which is again almost similar to the present study findings. A study conducted by Singh et al,[20] among bank employees of Jammu reported a comparable prevalence of overweight (47.5%) and a lower proportion of 8.8 % of obesity. Similar results were reported in a study conducted by Kumar et al.16 with a prevalence of 40.6% of overweight and 8.9% of obesity. Similar findings were found in the study conducted by Yakubu et al,[21] among bank workers in Northwest Nigeria, where the prevalence of overweight was 50% and obesity was 15.4%. Thus, the present study findings agree with findings from other studies across India and the world. A study conducted by Kumar et al,[22] reported that the overall prevalence of overweight and obesity was 56.11%. A lowered prevalence was reported by Shah et al,[12] study, wherein it was found that the overall prevalence of overweight and obesity was 39.5%. In Kulkarni et al,[14] study, it was found to be 34.5% (overweight and obesity combined). In all three studies, the prevalence of overweight and obesity was combined.

In the present study, It was found that the proportion of vigorously and moderately intensive work was found to be 1.6% and 9.7%, respectively. Thus, only 11.3% of subjects were engaged in moderate or vigorous-intensity work activities. Travel from place to place by walking or by bicycle was found in only 21.3% of subjects. The subjects were engaged in vigorous recreational activities in only 7.5% and moderate recreational activities in 24.7% of cases. Thus, in the present study, it was found that only 23.8% were sufficiently active, while the remaining 76.2% were physically inactive. Similar results were found in Brahmankar et al,[17] studies, with a majority of the bank employees (85%) being physically inactive.

In the current study, excessive usage of computers/Mobile (more than 6 hours per day) is reported by 79.4% of the subjects. A similar finding was reported in the study by Workneh et al,[23] where 63.8% of the subjects were using a computer for more than eight hours. In the Chavhan et al,[24] study, it was found that 42.4% of the study subjects spent more than 6 hours working on computers. This lifestyle habit of sitting near a computer for long hours without a break is becoming an important risk factor for the development of obesity and central obesity.

In the present study, 62.8% of the participants were found to have work-related stress. A study conducted by Shah et al,[12] reported that 51.2% had stress, which was similar to the findings in the current study. In contrast, a study conducted by Chavhan et al,[24] reported a lower prevalence of stress (38.1%).

In the current study, the prevalence of obesity was found to be highest in the 50 & above years age group (26.3%), followed by the 30-39 years group (15.2%). The differences were also found to be highly statistically significant (P<0.001; S). Hirani et al,[1] study also found the prevalence of obesity to be higher in the 45 and above years age group (33.3%) followed by the 35-44 years group (31.0%), which was, however, not significant. In the present study, the prevalence of obesity was found to be higher in the manager group (19.4%) compared to the officer group (16.7%) and clerk group (8.7%). Similar observations were made in the Hirani S et al,[1] study, with the prevalence of obesity being significantly higher in the manager group (39.6%) compared to the officer group (27.3%) and clerk groups (34.1%).

In the present study, the prevalence of obesity was found to be comparatively higher in those who are physically inactive (16.8%) compared to those who are sufficiently active (9.2%). The differences are also highly statistically significant (P=0.0063; S). In the Addo et al,[19] study, the prevalence of overweight and obesity was found to be significantly higher in those who are physically inactive (66.7%) compared to those who are sufficiently active (36.7%). In the present study, the prevalence of overweight and obesity did not show any association with regular consumption of fruits. This was similar to the Zubery et al,[25] study, where it was also found that the prevalence was similar in those consuming or not consuming fruits regularly. In the present study, it was found that the prevalence of obesity was found to be higher in those consuming fried foods regularly (more than 3 times per week) (19.9%) compared to those who are not consuming fried foods regularly (10.4%). The differences are also statistically significant (P=0.018; S). Namdev et al,[26] study has found that the prevalence of obesity is significantly higher in those consuming fried foods regularly (89%) compared to those who are not consuming fried foods regularly (11%). The differences are not statistically significant (P=0.56; NS). In the present study, the prevalence of central obesity was found to be similar in those with work-related stress (35.3%) and without stress (34.3%). The differences are also not statistically significant (P=0.86; NS). In the present study, the prevalence of obesity is found to be higher in those with work stress (16.4%) compared to those without work-related stress (12.6%). However, the differences are not statistically significant (P=0.63; NS).

CONCLUSION

Based on the current study, it can be deduced that there is a notably high incidence of generalised obesity among bank employees. The significant risk factors linked to obesity included age, job level, marital status, family history of obesity, physical activity levels, and frequent consumption of fried foods.

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