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Magnitude of Central Obesity and Associated Factors among Commercial Bank Employees in Addis Ababa, Ethiopia, 2021: An Institution-Based Cross-Sectional Study

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Abstract

Background: Central obesity is becoming the most common public health problems globally. In particular, central obesity, which indicates abnormal fat accumulation in the abdominal regions, is highly associated with risk of developing chronic illnesses such as cardiometabolic diseases, diabetes mellitus, and other non-communicable diseases. Therefore, this study was planned to assess the magnitude of central obesity and associated factors among commercial bank employees, in Addis Ababa, Ethiopia, 2022.

Methods: An institutional-based cross-sectional study was conducted in Addis Ababa, Ethiopia from September 1-30, 2021. A multi-stage sampling technique was employed to select 592 study participants. Waist circumference was measured at the midpoint between the lower rib border and the top of iliac crest. EpiData version 3.1 was used to enter data, and SPSS version 21 was used to analyze it. The factors associated with central obesity were identified by bivariate and multivariate logistic regression analysis. The degree of association of the factors was measured using an adjusted odds ratio (AOR) with a 95% confidence interval. A P-value < 0.05 was used to declare statistical significance.

Result: The magnitude of central obesity with waist circumference among commercial bank of Ethiopia was 34.6% (95% CI: 30.9%-38.5%). Being married [AOR=9.68, 95% CI: (5.76-16.89)], female gender[AOR=1.74, 95%CI: (1.09-2.76)], meat consumption 1-4 times per week [AOR=1.79, 95% CI: (1.11-2.91)], meat consumption>=5 per week[AOR=2.52, 95% CI: (1.32-4.82)], snacking [AOR=1.994, 95% CI: (1.26-3.16)], ever alcohol consumption[AOR=1.75, 95% CI: (1.11-2.78)], and house hold income >=24,009 Ethiopian Birr[AOR=2.86, 95% CI: (1.08-7.55)] were significant factors associated with central obesity.

Conclusion: This study revealed that the prevalence of central obesity among commercial bank workers was high. Therefore, governmental and non-governmental organizations that work in the health system as well as health professionals should focus on the preventive measures of central obesity such as healthy diet education in order to control its associated disorders at an early stage.

Keywords: Central obesity; Waist circumference; Magnitude; Addis Ababa

Introduction

Obesity is a medical condition that is characterized by abnormal or excessive fat accumulation due to energy imbalance between calories consumed and calories expended, which can be harmful to one's health [1]. Central obesity is defined as an excess accumulation of fat in the abdominal area, particularly due to excess visceral fat [2]. Clinically, central obesity is defined by a waist/hip ratio (>1.0 in men or >0.90 in women) or waist circumference (>102 cm in men or >88 cm in women) [3]. Obesity is an emrging medical condition in every corner of the world. It has been tripled since 1975. More than 1.9 billion adults were obese in 2016. Among 1.9 billion adults, more than 650 million adults were obese(1). A recent meta-analysis also estimated that the global prevalence of central obesity was 41.5%. In terms of regional disparity, the highest prevalence was observed in South America (55.1%), Central America (52.9%), and Africa (49.6%). Rich nations had a higher prevalence (42%) when compared to low income nations (27.8%) [4]. Central obesity has a significant impact on the physical health status of a person [5]. Most of the physical impact of adult obesity was found to include issues such as impaired insulin sensitivity, cardiovascular diseases [6], kidney [7,8], diabetes [9], colorectal [1], and esophageal cancers [1] as well as hypertension [2]. Poor academic performance, depression, and low self-image wereall observed to have psychological consequences in obese people. Central obesity is measured by waist circumference (WC), waist-to-hip ratio (WHR) and waist-to-height ratio (WHTR).Waist circumference (WC) has been described as a better tool for assessing central obesity which has been linked to a number of no communicable diseases and alone could replace both waist-hip ratio and BMI as a single risk factor for all-cause mortality. An increased level of WC has more clinical importance than BMI in determining mortality risk. Obesity is caused by a combination of factors in reality. Studies suggested that, urbanization, sedentary lifestyles, unhealthy dietary practices, and lack of physical activity were considered as risk factors of obesity. Likewise, age, high economic level, female gender, marital status, genetic factors, alcohol consumption and energy dense foods were some of the factors associated with central obesity. Different

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nutrition programs in Ethiopia give more attention to under nutrition irrespective of the rise of obesity in the country. The country has also been implementing food and nutrition policy since 2018 which emphasize on optimal nutrition at all stages of life as a policy direction and to some extent the policy try to emphasize on improvements of the nutritional status of people with non-communicable diseases as intervention program. Additionally, the country has also been implementing Food-based dietary guidelines (FBDG) and national food and nutrition strategy (FNS) which are important in tackling the problems of obesity. To some extent, the nutrition programs and policy which has been implemented so far focus more on under nutrition than over nutrition (obesity). Evidence suggests that non-communicable diseases (NCDs) are dramatically increasing in Ethiopia and it was estimated that NCDs were responsible for 711 deaths per 100, 00083 populations in 2015. According to World Health Organization data from 2018, the non-communicable diseases (NCDs) country profiles of Ethiopia estimated that deaths from cardiovascular diseases (CVDs), cancers, diabetes, and other non-communicable diseases were 16%, 7%, 2%, and 12%, respectively, with the total estimated deaths from noncommunicable diseases accounting for 39% of all deaths. Despite the lack of well-documented national data and studies on central obesity in Ethiopia, researchers have made a few studies on central obesity and associated factors, which have shown that the prevalence of central obesity is on the rise. A study conducted in the cities of Dilla, Gonder, Diredawa, and Northwest Ethiopia, the prevalence of central obesity was found to be 24.4%, 33.6%, 46.6%, and 37.6%, respectively. The Ethiopian demographic and health survey EDHS 2016 report also showed that the proportion of women who were overweight or obese had increased from 3% in 2000 to 8% in 2016 and the proportion of men who were obese were found to be 3%. Studies have identified that some kinds of jobs predispose people to sedentary lifestyles and some of these are banker's jobs, which are characterized by sitting for long periods of time. Most of the employees of financial institutions (banks) who serve in the bank office (customer service, managers, and tellers) spend most of their time sitting down due to the nature of their work. These groups of individuals spend their part of life less engaged in physical activities. The sedentary lifestyles, along with other socioeconomic and dietary factors, might contribute to the occurrence of central obesity among bank professionals. Therefore, it is important to distinguish the associated factors for central obesity among the professional group of bankers since they have a key role in the rising finance sector in the country. Previously, there were no similar studies conducted on the magnitude Figure 1 of central obesity and associated factors among commercial bank workers in Addis Ababa. Therefore, this study was aimed to assess the magnitude and associated factors of central obesity among commercial bank workers in Addis Ababa.

Methods

Study area and period

The study was conducted among commercial bank workers in Addis Ababa city from December 1-30, 2021. From a total of eight districts of the commercial banks of Ethiopia in Addis Ababa, Arada and Megenanga districts were selected for this study. Addis Ababa is the capital city of Ethiopia and was established in 1886. The city is divided into 11 sub-cities called kifle-ketema and 116 woredas. Addis Ababa is the largest city in the country by population, with a total population estimated to be 5,005,524 in 2021. This population was estimated and projected come from the latest revision of the UN World Urbanization Prospects. The bank has around 9,235 employees.

Study design and population

An institution based cross-sectional study was conducted among a commercial bank of Ethiopia employees in Addis Ababa. The source population was all commercial bank of Ethiopia workers in Addis Ababa, in the year 2021 and study population was all commercial bank employees working in the selected commercial bank districts. Study unit was randomly selected commercial bank employees working in

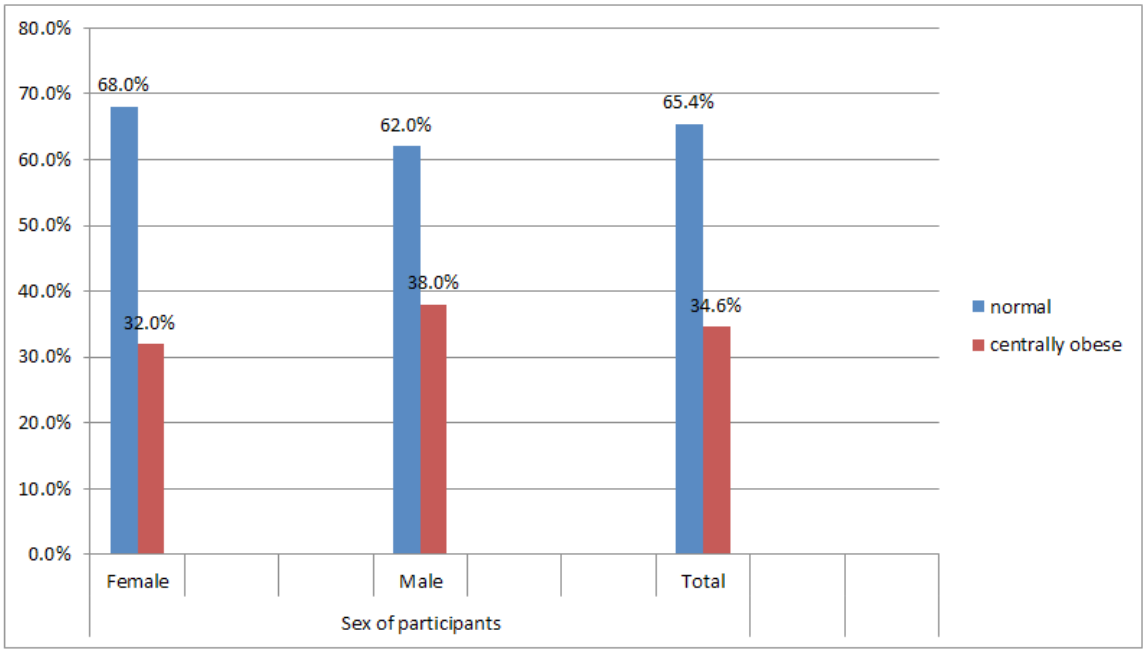

Figure 1: Magnitude of central obesity among commercial bank workers in Addis Ababa, Ethiopia, 2022.

the selected commercial bank branches.

Sample size determination

Sample size was calculated using single population proportion formula $n = \frac{Z_{\frac{\alpha}{2}}^2 P(1-P)}{MOE^2} * Deff\ ]$ by using the maximum proportion of central obesity 50%, at a 95% confidence interval and a 5% margin of error, the sample size was 386. However, based on the number of employee in commercial bank of Ethiopia at Addis Ababa branch, the total employee was 9235(<10,000). Hence, correction formula was used to determine the final sample size. The Final sample size calculated by the correction formula was 370. By considering 10% non-response rate and design effect 1.5, the final sample size was 592.

Sampling technique

In this study, a multi-stage sampling technique was used. First, the two districts were selected by using a simple random sampling technique, which covered 30% of the total district commercial bank of Addis Ababa. Megenagna and Arada districts were selected by simple random sampling as primary sampling units. After selecting two districts, twelve branches were selected from Megenagna district and eight branches were selected from Arada district by simple random sampling as a secondary sampling unit. Then samples were allocated to each selected branch proportionally based on their total number of employees. The list of bank workers from the selected branches was used as a sampling frame to select the participants of the study, by a simple random sampling technique, from each of the CBE branches.

Eligilibilty criteria

Inclusion criteria: All bank workers who attend the office during the study period were included.

Exclusion criteria: Individuals who were severely ill, Workers who have deformity around abdominal area, Pregnant mothers and bank workers who have less than six months of work experience in the organization were excluded.

Study variables

Abdominal obesity was considered as the dependent variable of the study. Whereas independent variables were socio-demographic factors, behavioral factors, such as smoking, drinking alcohol, dietary factors, such as consumption of fruits and vegetables, consumption of fast food (chips, sandwich, biscuits, burger, pizza, ice cream), type of oil used for meal preparation (seed oil, palm oil, butter), bread and cereals, egg, meat, milk products (cheese, yogurt), soft drink, sugar and sweets, meals (breakfast, lunch, dinner), snack, legumes (peas, beans, nuts, lentils).

Operational definitions

Alcohol use: consumed an alcoholic drink (Beer, Tella, Tej, Areke, Draft, Uzo, whisky) in the past 12 months.Consumption of at least one standard alcoholusing local conventional measures during the reporting periods.

Bank workers: is who work office based work in commercial bank of Ethiopia at least six month in organization.

Fast food consumption: Consumption of food made by fastfoods, such as burger, pizza, bombolino, chips, biscuit, sanbusaand the like.

Central obesity: The world health organization cut off points for a female is defined as a waist circumference (WC)>88 cm and >102 cm for male.

Moderate exercise: Low impact aerobic exercise like walking to office, playing on the playground (volleyball).

Vigorous exercise: high-intensity aerobic classes like competitive full-field sports (soccer) or basketball, swimming, running, gymnastics.

Total physical activity meet: Total physical activity MET minutes per week is > 600.

Total physical activity not meet: Total physical activity MET minutes per week is < 600.

Smoker: Currently smoke daily any tobacco products, such as cigarettes, cigars, or pipes

Chat chewer: Chewing chat in the lifetime.

Data collection tools and techniques

A structured questionnaire and non-stretchable, flexible tape were used for data collection. Most of the questionnaires were adapted and modified from the previous studies and WHO.

Data collection procedure

A structured questionnaire was used for a face-to-face data collection. Four diploma Nurses' and two supervisors health officers were recruited for data collection. Central obesity was assessed using waist circumference of the participants. The World Health Organization STEPS protocol for measuring waist circumference (WC) in centimeters was measured at the approximate midpoint between the lower margin of the last palpable rib and the top iliac crest at the end of expiration while participants were standing upright and rounded to the nearest 0.1 cm. Waist circumference in centimeters was measured using a flexible and non-stretchable tape measure. Four diploma nurses and two supervisor health officers were recruited for data collection. The assessment of central obesity involved measuring the waist circumference of the participants. The measurement was conducted according to the World Health Organization STEPS protocol, which required measuring the waist circumference in centimeters at the approximate midpoint between the lower margin of the last palpable rib and the top iliac crest. This measurement was taken at the end of expiration while the participants were standing upright. The waist circumference was then rounded to the nearest 0.1 cm. To ensure accuracy, a flexible and non-stretchable tape measure was used for this purpose.

Data quality assurance

To assure data quality structured questionnaire was prepared in English and later translated to the Amharic language in which the researcher going to use it for data collection. Pretest of the questionnaire was employed in Addis Ababa in some branches before the actual data collection by taking 5% of the total of the sample size on 30 individuals, to check the validity and reliability of the questionnaire. Double checking throughout the data collection was done by the researcher to assure the completeness and logical consistency of the collected data. Data collectors were selected carefully based on their educational status. One day training was also given to the data collectors and supervisors on the objective of the study. Likewise, training was also given about the entire data collection procedure.

Data processing and analysis

The collected data was checked for its completeness and consistency

before entering data on the computer. Each completed questionnaire was assigned a unique code. The data was entered in to Epi Data 3.1 Statistical software and cleared for implausible and missed values. Then entered data was imported to SPSS version 21 for analysis.

A first, descriptive analysis was carried out to explore the socio-demographic characteristics of the respondents. Then statistical analysis was done using bivariate logistic regressions to determine the association between outcome variable and predictor variables. Significant variables that give a p-value of < 0.25 in the bivariate analysis were candidate for further analysis using multivariate logistic regressions analysis. Model fitness test was checked by using Hosmer and Lemeshow test to assess fitness of the independent variables. The Adjusted odd ratio at 95% CI was estimated using multivariate logistic analysis and p-values <0.05 was used to declare significant association

Results

Sociodemographic characteristics

From a total of 592 study participants complete information were obtained from 592 working bankers which gave a response rate of 100%. Among the study participants 278(47%) and 286(48.3%) were single and married respectively. More than half 565(94.4%) of the study participants were a degree holder. Only 27 (4.6%) of the study participants had educational level of masters and above. Of the participants, 479(80.6%) were orthodox tewahido religion followers, followed by Protestants 75 (12.7%) and Muslims 29 (4.9%).

Food consumption frequency factors

According to the data obtained from food frequency, of the total respondent, 252(42.6%) consumed fruit three or less times per month and 255(43.1%) consumed 1-4 times within a week. About 124 (20.4%) of study participants were consumed vegetable five and above times per week. Regarding the consumption of bread and cereals, 354(59.8%) consumed daily and 238(40.2%) consumed not daily. According to this data cereals were the common source of food group among respondents. Nearly sixty percent of respondents (59.3%) consumed egg >=1 perweek. More than half of the respondents 359(60.1%), 347(58.6%), 320(54.1%), 402(67.9%), and 380(64.2%) consumed meat, legumes, milk products, fast food, and sweetened beverages three or less times in a month respectively.

Dietary habit factor

Of the total respondents, 526(88.9%) had three and more meals per day and only 66(11.1%) had less than three meals per day. Nearly three fourth 410(69.3%)of the study participantsreported that they didn't consume breakfast on a daily basis. Only 182(30.7%)of the respondents were consumed breakfast on a daily basis.The majority of the respondents (524(88.9%), 511(86.3%)) were consumed lunch and dinner on a daily basis respectively. More than two third 378(63%) of respondents were commonly used seed oil (sunflower) for household food preparation, followed by palm oil 165(27.9%) and butter 54(9.1%). Of the total study participants, 478(80.7%)of the respondents reported that they were used meal prepared at home on daily basis (Tables 1-5).

Beahavioral factor

Of the total study participants, 583(98.5%) were non-smoker. Nearly three fourth 431(72.8) of the respondents were not ever consumed alcohol. About 573(96.8%) of the respondents were never chewed khat in their lifetime. Study participants who meet the WHO recommendation of total physical activity level were 40(6.8%)and the rest 229(38.7%) didn't meet the WHO recommendation. Resondents who were not participate in any physical activity were 54%.

Table 1: Socio-demographic characteristics of the Commercial Bank of Ethiopia in Addis Ababa, Ethiopia 2022 (n=592).

Variable	Frequency	Percent
Age		
20-28	344	58.1
29-37	174	29.4
38-46	56	9.5
47-55	18	3
sex		
Female	334	56.4
Male	258	43.6
Marital status		
single	278	47
married	286	48
divorced	28	4.7
level of education		
degree	565	95.4
masters and above	27	4.6
Religion		
Orthodox tewahido	479	80.9
Protestant	75	12.7
Muslim	29	4.9
Catholics	9	1.5
Salary		
3000-10,000	104	17.6
10,001-17,001	249	42.1
24,002-310	198	33.4
>=31003	41	6.9
Family size		
<=3	237	40
>=4	355	60
Age		
20-28	344	58.1
29-37	174	29.4
38-46	56	9.5
47-55	18	3

Magnitude of central obesity

The prevalence of central obesity among commercial bank workers in Addis Ababa by waist circumference (WC) was 34.6%(95% CI: 30.9%-38.5%). The prevalence among female and male employees was 32% and 38% respectively.

Multivariate analysis

In bivariate logistic regression analysis variables with p-value less than 0.25 were identified and considered for further analysis. As a result, marital status, age, sex, family size, bread and cereals, consumption of meat, milk, cheese and yogurt, sweet, consumption of snack, sweet beverages, time spend sitting or recycling, total physical activity(TPA), kchat chewing, household income, and alcohol daily consumption were candidate for multivariable logistic regression analysis. Finally, marital status, consumption of meat, consumption of snack, household income and alcohol daily consumption were significantly associated with abdominal obesity at p-value less than 0.05. Being married and divorced were 9.861 and 15.803 times more likely to develop abdominal obesity when compared to unmarried bank workers [AOR=9.861;95% CI: (5.759-16.886)] and [AOR=15.803;95% CI: (5.933-42.096)], respectively. Respondents who consumed meat

Table 2: Food consumption frequency among commercial bank employee in Addis Ababa city, Ethiopia, 2022(n=592).

Variable	Frequency	Percent
Fruit		
three or less times monthly	252	42.6
1-4 per week	255	43.1
>=5 times per week	85	14.4
Vegetables		
three or less times monthly	153	25.8
1-4 times per week	315	53.2
>=5 times per week	124	20.9
Bread and cereals		
not daily	238	40.2
Daily	354	59.8
Egg		
less than once in a month	58	9.8
1-3 times monthly	183	30.9
>=1 per week	351	59.3
Meat		
three or less times monthly	359	60
1-4 times per week	152	25.7
>=5 times per week	81	13.7
Legumes		
three or less times monthly	347	58.6
1-4 per week	173	29.2
>=5 times per week	72	12.2
Milk, cheese, yogurt		
three or less times monthly	320	54.1
1-4 times per week	194	32.8
>=5 times per week	78	13.2
Sweets		
three or less times monthly	284	48
1-4 times per week	158	26.7
>=5 times per week	150	25.3
Fast food		
three or less times monthly	402	67.9
1-4 times per week	151	25.5
>=5 times per week	39	6.6
sweetened beverages		
three or less times monthly	380	64.2
1-4 times per week	149	25.2
>=5 times per week	63	10.6

more or equal to five times per week were found to be 2.519 times more likely to develop abdominal obesity [AOR=2.519; 95% CI=(1.317-4.818)] when compared to those who consumed meat three or less times monthly. The odds of central obesity was higher among those who had ever consumed alcohol [COR=1.754, 95% CI=(1.106-2.781)] as compared to those who hadn't drunk alcohol. Moreover, respondents who consumed snack were 1.994 times more likely to be abdominally obese [AOR=1.994; 95% CI: (1.256-3.163)] than who did not consume snack.

Discussion

The aim of this study was to determine the magnitude and associated factor of central obesity among commercial bank employee in Addis Ababa. The overall magnitude of central obesity was 34.6%. It was consistent with study findings from Ghana(31.2%)(38), china (37.6), and spain(33.4%). The result of this study was also higher than study done in Nekemete town (28.4%), Dilla (16.5%), and lower than study done in Sidama (50.4%). The discrepancy might be due to study population difference, sample size difference and central

Table 3: Dietary habit among commercial bank employees in Addis Ababa city, Ethiopia 2022(n=592).

Variable	Frequency	Percent
Number of meals per day		
<3 meal per day	66	11.1
>=3 meal per day	526	88.9
Breakfast		
not daily	410	69.3
daily	182	30.7
lunch		
not daily	68	11.5
daily	524	88.5
Snack		
no	404	68.2
yes	168	31.8
Number of snack		
No	404	68.2
<=2 per day	135	22.8
>=3 per day	53	9
dinner		
not daily	81	13.7
daily	511	86.3
Eat during bed times		
not daily	532	89.9
daily	60	10.1
meal out of home		
never	117	19.8
not daily	429	72.5
daily	46	7.7
meal prepared at home		
not daily	114	19.3
daily	478	80.7
Oil most used		
seed oil	378	63
palm oil	165	27.9
Butter	54	9.1

Table 4: Behavioral factor among commercial bank of Ethiopia in Addis Ababa city, Ethiopia, 2022(n=592).

Variable	Frequency	Percent
Ever smoked tobacco		
No	583	98.5
Yes	9	1.5
current smoker		
No	586	99
Yes	6	1
No of cigarette sticks smoke in a day		
No smoke in a day	583	98.5
< =5 sticks	8	1.4
>= 6 sticks	1	0.2
Ever alcohol consumption		
No	431	72.8
Yes	161	27.2
number of standard drinks		
No drink	433	73.1
< 2 standard drinking	49	8.1
>=2 standard drinking	110	18.6
Frequency of alcohol drink		
No drink	431	72
Daily	12	2
>=1 per week	106	17.9
<1 in a month	43	7.3
khat chewing		
No	573	96.8
Yes	19	3.2
Total physical activity level		
no physical activity	323	54.6
< 600MET(un meet)	229	38.7
>=600(meet)	40	6.8
time spend sitting or reclining		
< 5 hour	207	35
5-8 hour	385	65

Table 5: Multivarible logistic regression predicting the odds of central obesity among commercial Bank of Ethiopia employee in Addis Ababa, Ethiopia, 2022(n=592).

	Abdominal Obesity By WC				
Variable	Yes	No	COR; 95%CI	AOR;95%CI	p-value
Marital status					
Single	35	243	1	1	
Married	152	134	7.875(5.156-12.030*)	9.861(5.759-16.886)*	0.000*
Divorced	18	10	12.497(5.340-29.250)	15.803(5.933-42.096)*	0.000*
Age					
20-28	90	254	1	1	
29-37	75	99	2.138(1.456-3.1450)*	0.958(0.581-1.580)	0.868
38-46	29	27	3.031(1.703-5.396)*	1.278(0.622-2.626)	0.504
47-55	11	7	4.435(1.668-11.789)*	1.449(0.475-2.626)	0.514
Sex					
Female	107	227	0.770(0.547-1.082)	1.741(1.099-2.759)*	0.018*
Male	98	160	1	1	
Household income					
3000-10000	19	85	1	1	
10,001-17,001	78	171	2.041(1.160-3.590)	1.709(0.876-16.886)	0.116
17,002-24,002	90	108	3.728(2.107-6.596)	2.276(1.132-4.575)*	0.021*
>=24,003	18	23	3.501(1.585-7.733)	2.857(1.082-7.547)*	0.034*
Family size					
<=3	61	176	0.508(0.354-0.728)	0.876(0.539-1.425)	0.595
>=4	144	211	1	1	
Bread and cereals					
Not daily	65	173	1	1	
Once or more times per day	140	214	1.741(1.220-2.486)	1.395(0.865-2.249)	0.172
Meat					
Three or less times monthly	101	258	1	1	
1-4 Times per week	63	89	1.808(1.217-2.688)*	1.793(1.105-2.912)*	0.018*
>=5 Times per week	41	40	2.618(1.600-4.285)*	2.519(1.317-4.818)*	0.005*
Milk, cheese, yogurt					
Three or less times monthly	106	214	1	1	
1-4 Times per week	67	127	1.065(0.731-1.552)	0.741(0.461-1.190)	0.215
>=5 Times per week	32	46	1.404(0.845-2.333)	0.763(0.402-1.449)	0.409
Sweets					
Three or less times monthly	84	200	1	1	
1-4 Times per week	63	95	1.579(1.050-2.374)*	1.276(0.760-2.142)	0.357
>=5 Times per week	58	92	1.501(0.990-2.275)	1.555(0.895-2.700)	0.117
Sweetened beverages					
Three or less times monthly	124	256	1	1	
1-4 Times per week	49	100	1.012(0.676-1.514)	0.811(0.472-1.393)	0.447
>=5 Times per week	32	31	2.131(1.244-3.651)*	2.010(0.971-4.161)	0.060
Snack					
No	124	280	1	1	
Yes	81	107	1.709(1.195-2.445)*	1.994(1.256-3.163)*	0.003*
Ever alcohol consumption					
No	127	304	1	1	
Yes	78	83	2.250(1.551-3.263)	1.754(1.106-2.781)*	0.017*
Time spend sitting or reclining					
< 5 hour	65	142	1	1	
5-8 hour	140	245	1.248(0.871-1.788)*	0.969(0.617-1.522)	0.890
Khat chewing					
No	196	377	1	1	
Yes	9	10	1.731(0.692-4.331)	1.193(0.377-3.779)	0.764
TPA					
<600(met)	196	356	1.896(0.885-4.064)	0.508(0.195-1.324)	0.166
>600(met)	9	31	1	1	

obesity measurement WHO cut off points. For instance, study done in Nekemte and Dilla were population based study, while this study was institution based study. In addition, another reason might be that the lifestyle of bankers in Addis Ababa might be different from that of the population of Dilla and Sidama. Since Addis Ababa is a metropolitan city, bankers may use vehicle transportation instead of walking, and dietary patterns practiced in Addis Ababa might favor for the increase in magnitude of central obesity. Similarly, a study conducted in Sidama used waist hip ratio anthropometric measurements, but this study used only waist circumference measurements. The sample size in this study was also larger than in Nekemte's study. This study dentified that marital status, being female, household income; meat consumption, snack consumption and alcohol consumption were predictors of central obesity. Marital status was one of the predictors of central obesity among bank employees in this study. Married bank emloyees was more than nine times to be centrally obese when compared to the single respondents. This result was consistent with studies conducted in Greek, Nigeria, and Iran. This can be explained by the fact that after marriage individuals may have less physical activity, change dietary patterns. Due to this, married study participants may have more social support than those who are not married. This marital support can lead to obesity through food, activity and social values. On the other hand, single people might control their weight to attract mate, and once they get married, weight control may be less valued so that diet/ exercise behaviors for slimness may be neglected or they may not give attention for attractiveness once they have got their own life partners. Being divorced was one of the predictors of abdominal obesity among bank employees in this study. A study done in united states of America revealed that overweight/obesity is more prevalent among divorced black women and widowed Hispanic men [Sobal, 2006 #2655]. This happens because studies show that married men get a health benefit from marriage, and they lose that benefit once they get divorced, which may lead to their weight gain which leads to obesity and central obesity. Female gender was found to be significantly associated with central obesity among the study participants. Being female was nearly two times to be centrally obese when compared to the male counterpart. This finding is consistent with several other studies in Nigeria and other African countries. This was however, contrary to the report from most high-income countries where male gender was reported to be associated with obesity. Several reasons have been proffered as being responsible for the higher prevalence of obesity found among females. Some author argued that the higher prevalence of obesity found among females is basically a result of behavioral factors because both male and females are exposed to genetic, physical and environmental conditions that predispose them to obesity. Cultural beliefs have also been identified as a plausible factor. The possible reason for this variation could be that the female have more steroid hormones which expose them to obesity. The other possible explanation could be that, in the Ethiopian cultural context, men mostly engaged in activities that require higher energy than women. The findings of this study also revealed that consumption of meat 1-4 and >=5 times perweek were associated with central obesity by WC which revealed that the more you consume meat based food products the more you become centrally obese. The odds to develop abdominal obesity who ate meat 1-4 perweek was nearly two times as compared to those who ate meat three or less times in a month. Likewise, using meat products greater than or equal to five times perweek increased the chance of developing central obesity by 2.519 times greater than those who consumed three or less times in amonth.This happen because meats have high energy and high fat content that might be associated with higher risk of, overweight, general and central obesity.This result was similar with study done in USA, Woldia and Hawassa Ethiopia. The current study also showed that consumption of snack nearly two times more likely to develop central obesity than those who didn't consume snack. Even though the relationship between snacking and obesity or abdominal obesity is not clear, some studies have found that the increased consumption of energy-dense, high-sugar, high-fat meals snacking has been regarded one of the key factors to obesity. Other studies failed to establish the relationship between snacking and obesity or abdominal obesity. This is because the type of snack practiced matters. Those who ate energy-dense and sugary snacks may susceptible to abdominal obesity and those who ate healthy snack intake may not develop central obesity. This result was comparable with study conducted in south East Asian nation countries and northeast Ethiopia. Alcohol consumption was one of the determinant factors of central obesity. Bank employees who drink alcohols were 1.754 times more likely to develop central obesity than who didn't drink alcohol. Study findings from Portugal, Brasil, Korean, Ghana, Woldia, and Diredawa were consistent with this study. This happens because alcohol represents an important source of energy. Despite its comparatively high energy content of 7.1 g/kcal, alcohol intake is a widespread activity globally and alcohol energy can be a contributing factor to weight gain which leads to obesity. When a person consumes alcohol, the caloric intake increases and it causes weight gain. Excessive consumption of ethanol may result in a positive energy balance, which may, over time, result in being overweight or obese/ central obesity. This study also revealed that bankers who get salary 17,002-24,002 and >=24,003 ETB were 2.276 and 2.857 times develop central obesity respectively when compared to those who get salary of 3000-10,000 ETB. This result is supported by previously study done in India and Hawassa city which revealed that higher socioeconomic status and highest income tercile was predictors of obesity. Economic development potentially induces changes such as changing diet, labor market structure, and culture about body shape that may reshape the income-obesity relationship in a society.

Limitation of The Study

This study could have some limitations which affect the result directly or indirectly. This study was not included other measurement like skin fold thickness and biochemical analysis. Additionally, the capacity to measure respondents' dietary intakes of total calories, other nutrients, and food portions was not evaluated. BMI and WHR were not used to measure obesity and central obesity.

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Authors' Contributions

Ayele Worku: Revising proposal, data analysis, report writing, editing, and developing the manuscript. Yodit Abel: Conceptualization and development of the proposal, data Collection, and draft data analysis. Elzabeth Seyoum: Preparing the manuscript, editing, and data curation. Genanew Kassie: Data analysis, review, editing and approved the final manuscript.

Declaration of Conflicting Interest

The authors declared that there were no computing interests in this study.

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Ethical Considerations

Ethical approval was obtained from Gamby medical and business college Ethics and research review board. Written permission letter was sought from the management of the bank before commencement of the study. Written informed consent was also obtained from each study participants after detailed information was provided to each individual. The ethical principles outlined by Declaration of Helsinki guided the entire research process, which states that "It is the physician's or researcher's responsibility to promote and protect the health, well-being, and rights of study participants, including those who participate in medical research

Informed Consent

Written informed consent was taken from study subjects. The objective, purpose, risk and benefit, confidentiality, procedure and duration and right to withdraw or complete were explained for the study participants.

Consent for Publication

Not applicable

Availability of data

The datasets analyzed for this study are available from the corresponding author based on a reasonable request.

Abbreviation

AOR: Adjusted Odd Ratio;CI: Confidence Interval; CVD: Cardiovascular Vascular Disease CBE; Commercial Bank of Ethiopia; COR: Crude Odd Ratio; DM: Diabetes Mellitus; FBDG: Food-Based Dietary Guidelines: FMOH: Federal Ministry of health; HTN: Hypertension; IOTF: International Obesity Task Force; NCD: Non Communicable Diseases; NNP: National Nutrition Program; NFP: Food and Nutrition policy; OR: Odd Ratio: SPSS: Statistical Package for Social Sciences; WC: Waist Circumference; WHO: World Health Organization; WHR: Waist Hip Ratio; WHtR: Waist to Height Ratio.

Conclusion

About 34.6% of the study participants were found to be centrally obese which is relatively high compared to other studies. Being married, divorced, being female, salary, consumption of meat and snack were the predictors of central obesity among commercial bank employees in Addis Ababa. Thus, governmental and non-governmental organizations that work in the health system as well as health professionals should focus on the preventive measures of central obesity such as healthy diet education in order to control its associated disorders at an early stage.

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