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Prevalence and Associated Factors Affecting Overweight and Obesity among First Year Medical Students in Dire Dawa University, Eastern Ethiopia

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Abstract

Introduction: Overweight and obesity becomes serious public health problem across the world. Regarding World Health Organization (WHO) report of 2018 about 39% and 13% of world population are at risk overweight and obesity respectively. Globally about 2.8 million deaths are caused by overweight and obesity. Countries annually spent 2.1 trillion dollar budget to reduce obesity related disease. Over weight and obesity reduce total Growth Demotic Product (GDP) of the country by 2.8% globally. Overweight and obesity is affected by different socio-economical factors.

Methods and material: Institutional based cross sectional study was conducted among 210 medical students in Dire Dawa University. Statistically determined study participants were selected by simple random sampling method. Pretested questioners were used to assess demographic and socio-economical factors. Data was entered using Epi data version 3.0 and analyzed by using SPSS version 23. Bivariate and multivariate logistic regression was performed to identify factors related with dependent variable. P-value less than 0.05 was set as statistically significant.

Results: More than half (51.4%) participants were male and majority of participants were found in 19 years old. About 59.5% of participants live in subtropical climate and 39% of participants sometimes miss breakfast. About 48.6%participants had experience performing moderate exercise daily. Prevalence of overweight and obesity was 5.2 and 0.5 respectively. Nearly half 100 (47.8%) of obese participants eat breakfast, lunch and dinner regularly. Climatic condition and experience of eating breakfast had statistically significant relation with overweight and obesity.

Conclusion: Even if overweight and obesity is serious health issue across the world, overweight and obesity was less prevalent among University students in Ethiopia. Parents average income, gender and climatic condition of respondent had statistically significant association with overweight and obesity whereas snack intake, physical activity, alcohol intake didn't show statistically significant association with overweight and obesity.

Keywords: Obesity; Overweight; Climate condition; Physical exercise; Growth Demotic Product (GDP)

Abbreviations: GDP: Growth Domestic Product; SSN: Southern Nation and Nationality; WHO: World Health Organisation

Introduction

Overweight and obesity is defined as excessive accumulation of fat in body which leads to develop different non communicable disease. Even though countries put policies to compact non communicable disease still overweight and obesity is one of key driver of non-communicable disease. Globally non communicable disease is the leading cause of mortality and morbidity. Non communicable disease causes 41 million deaths annually which account 71% of all death throughout the world. More than 85% of premature death occurred in low and middle income countries [1]. According to WHO report of 2018, about 39% of world's adult population was overweight and 13% of adults were obese. More than 1.9 billion adults are overweight and over 650 million adults are obese. Globally about 2.8 million deaths are caused by overweight and obesity [2]. Countries spent 2.1 trillion dollar of total budget to reduce obesity related disease. Overweight and obesity reduce total Growth Domestic Product (GDP) by 2.8% globally [3]. Across the world over weight and obesity becomes a serious problem of public health. About 44% of diabetes, 23% of ischemic heart disease and 7%-41% of cancers are caused with overweight and obesity. Adult obesity is highest among region of America (29%), 23% in Europe and 21% in East Mediterranean countries. It is estimated that prevalence of overweight and obesity can extend from 20%-50% by 2050 in Africa. About 20.8% Nigerian and 37.1% Ghanaian adult population are overweight. Surprisingly 31.3% South African adult population are with obesity [4]. In 2014, about 1.2% of men and 6.0% of females were with obesity in Ethiopia. Prevalence of obesity considerably increased in to 1.9 in male and 6.9 in female in 2016. Overweight and obesity is affected with different socio-economical factors. University students are vulnerable to obesity and overweight due to factors such as

increased fat rich food consumption, decreased physical activity and emotional change which stimulate food intake. Additionally, universities which they spend most of the day may not have safe conditions that make it difficult to adopt healthy habits [5]. Even if some studies were done in Ethiopia still there was no study done from university students specifically, that is why the current study was aimed to assess prevalence and associated factors related to obesity and overweight among Dire Dawa university medical students.

Materials and Methods

Study area

The present study was conducted from governmental medical school of Dire Dawa university college of health science and medicine. Dire Dawa university is one of public higher institution in Ethiopia since 2007. It is located 515 km East of Addis Ababa.

Study period

The study was conducted in March 2019.

Study design

Institutional based cross-sectional study was conducted among medical students.

Source of population

All medical students in Dire Dawa university.

Study population

All first year medical students who fulfill inclusion criteria.

Sample size

Sample size was statistically determined by using single mean proportion formula and it was corrected by correction formula since total population was less than 10,000. Finally about 210 respondents were included from the study.

Sampling method

Participants who fulfill inclusion criteria were selected by simple random sampling method.

Inclusion criteria

All year one medical students who were voluntary to be part of study were included.

Exclusion criteria

Students with spinal deformity, critically and unable to communicate were excluded.

Method of data collection

Structured questioner was designed to collect socio demographic data and other related factors. Each volunteer respondent was asked to fill the questioner and morphometric measurement was done by trained data collector. Height was measured to nearest 0.1 centimeters using a standiometer with subject standing erect on a horizontal resting plane of standiometer. Weight was measured with mechanical balance to nearest 0.1 kg and calibration was done in each step [6].

Data analysis and interpretation

Data was checked after and during collection from every participant for its completeness. The instrument and measurement procedure were checked for every participant for its consistency. Data was analyzed by using SSPS computer software version 23.0. Data was expressed using frequency distribution, mean and standard deviation. Factors associated with overweight and obesity was identified with bivariate and multivariate logistic regression analysis. Significance level of the present study was set as p-value less than 0.05.

Results

Out of total sample 108 (51.4%) of respondents were male and 102 (48.6%) of respondents were female in gender. About half of participants were 19 years old and mean age of respondents was 19.45 ± 0.993 year. Majority (39.5%) of respondents were from Amhara ethnic group. About 128 (61%) of participants were orthodox and rest of them were belong to Muslim, Protestant and Catholic religion. Majority about 85.7% of students were from urban dweller whereas 14.3% of participants were from rular area. Nearly half (47.6%) of parent's occupation of participants was government employer. About 10.5% of respondents mother was either illiterate or primary education completed whereas 25.7% mother of participants were degree holder. More than half (56.7%) of participant's parent monthly income was below 3000 birr. Majority (59.5%) of respondents were from Woinadega (sub-tropical) climatic condition whereas only 2.6% respondents were belonged to Bereha (Desert) climatic zone (Table 1).

Table 1: Scio democratic characteristics of respondents.

Character	Frequency	Percent
Gender		
Male	108	51.4

Female	102	48.6
Age		
18-19	131	62.4
20-22	79	37.6
Residence		
Urban	180	85.7
Rural	30	14.3
Educational status of mother of respondent		
Illiterate	22	10.5
Primary school	22	10.5
Secondary school	35	16.7
Diploma holder	50	23.8
Degree holder	54	25.7
Above degree holder	27	12.9
Occupation of parents		
Farmer	25	11.9
Merchant	25	11.9
Government employer	100	47.6
Private sector worker	60	28.6
Religion of respondents		
Orthodox	128	61
Muslim	38	18.1
Protestant	38	18.1
Catholic	1	0.5
Other	5	2.4
Monthly average income of parents		
1000-3000 birr	119	56.7
3001-6000 birr	18	8.6
6001-9000 birr	28	13.3
9001-15000 birr	31	14.8
Above 15000 birr	14	6.7

Family size		
Four	34	16.2
Six	45	21.4
Three	11	5.2
Five	72	34.3
More than six	48	22.9

Dietary and physical activity habits

About 39% of respondents sometimes miss eating breakfast whereas 2.9% of participants were never eat breakfast. Nearly half (49%) of respondents had experience of taking snack once per day. Majority (40.5%) of study participants consumed fast food one to two times per week. About 35.2% of participants consumed vegetable monthly where as 40.5% of participants consumed weekly. Regarding alcohol intake about 60% of participants had experience of taking alcohol. About 48.6% of respondents had experience of performing moderate physical activity (Table 2).

Table 2: Dietary and physical activity habit.

Character	Frequency	Percentage
Experience of eating food per day eat breakfast, lunch and dinner regularly		
Sometimes miss breakfast	100	47.6
Never eat breakfast	82	39
Sometimes miss dinner	6	2.9
Sanck taking experience	21	10
Once per day	103	49
Never take	64	30.5
Two times per day	38	18.1
More than two per day	5	2.4
Experience of fast food consumption		
Once per day	76	36.2
1-2 times per day	85	40.5
3-5 times per day	46	21.9
1-2 times per month	3	1.4
Experience of vegetable consumption		
Daily	48	22.9
Weekly	85	40.5
Monthly	74	35.2
Never	3	1.4

Alcohol intake		
Weekly	12	5.7
Monthly	114	54.3
Never	84	40
Experience of physical activity		
Low	89	42.4
Moderate	102	48.6
High	19	9

Prevalence of overweight and obesity

According to world health organization standard about 72.4% of participants had normal body mass index whereas about 18.6% of respondents were grouped in underweighted category. About 5.2% of participants were overweight whereas only 0.5% of respondents were obese.

Associated factors related with overweight and obesity

Overweight and obesity affected by nutritional status of participants and with practice of physical activity (Table 3).

Table 3: Factors associated with obesity.

Factor	Male (percent)	Female (percent)
Alcohol in take		
Weekly	6	1
Monthly	53.8	63.6
Never	40.2	36.4
Climatic condition		
Kola	22.1	27.3
Winadega	61.3	27.3
Dega	13.6	45.5
Bereha	3	1
Altitude		
High land	67.3	72.7
Low land	32.7	27.3
Experience of eating		
Always eat breakfast, lunch, dinner	47.7	45.5
Sometimes eat break fast	38.7	45.5
Never eat break fast	3	2
Sometimes miss dinner	10.15	9.1

Snack taking experience		
Once per day	49.2	45.5
Never take	31.2	18.2
Twice per day	17.6	27.3
More than two per day	2	9.1
Frequency of fast food consumption		
Once per day	36.7	27.3
1-2 per week	40.2	45.5
3-5 per week	21.6	27.3
1-2 per month	2	1
Frequency of vegetable consumption		
Daily	21.6	45.5
Weekly	40.7	36.4
Monthly	36.2	18.2
Never	2	1
Experience of physical activity		
Low	42.2	45.5
Moderate	48.7	45.5
High	9	9.1

As indicated from Figure 1 about 124 (59.3%) of obese participants were live in Woinadega (sub-tropical) climatic condition. Regarding alcohol intake more than half (54.1%) of males with obesity had experience of taking alcohol once per month. About 102 (48.8%) of respondents with obesity were engaged in doing moderate physical activates.

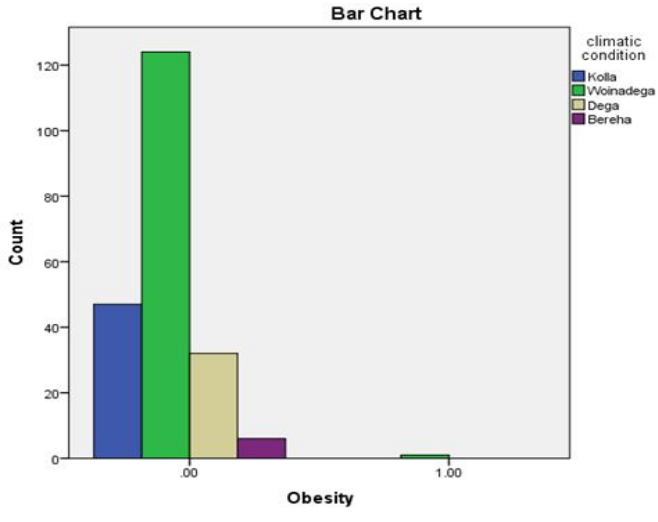

Figure1: Climatic condition of respondents among obese.

About 67.5% of obese participants were live in highland area whereas 32.5% of obese were belonged at low land area. Nearly half 100 (47.8%) of obese participants had experience of eating breakfast, lunch and dinner regularly but about 5 (2.4%) of obese participants never eat breakfast. Experience of eating breakfast had statistically significant relation (*chi-square* value of 34.16, p=0.000) with obesity (Table 3).

Regarding experience of snack taking there was no statically significant relation with obesity (p=0.61) even if 48.8% of participants take snack once per day. Nearly half (47.8%) of obese participants take vegetables daily.

Discussion

Knowing prevalence and associated factor of overweight and obesity is crucial for determining risky population for non-communicable disease. Prevalence of overweight and obesity was 5.2% and 0.5% respectively. Prevalence of overweight and obesity in current study is relatively lower as compare with other studies done in developed country. This may be due to adults in developed country have high tendency to take more energetic foods as compared with those living in developing country. Females are more susceptible to overweight and obesity as compare with males. National DHS survey in Ethiopia also reported that in 2016, 21% of female and 12% of male in urban area were either over weighted or obese. The observed obesity difference between two sexes can be due to biological and socio-economic factors. Some researchers also suggested that males engaged more in physical activity than female that leads male less likely to obese than female. It is also suggested that females gender hormone can accelerate deposition of fat in the body there by it can cause obesity [7]. Obesity and overweight was increased with age. Statistically significant association (p=0.000) was observed between age and overweight. Result of present study in line with study done in Mexico [8]. This difference with age can be due to changes in metabolic rate. Regarding climatic condition of study participants, it showed statistically significant (p=0.024) association with overweight. About 61.3% of overweighed participants were belonged from subtropical climatic condition this can be related with thermal body comfort as cited by Thapa S, et al. Dietary habit, alcohol intake and experience doing of physical have no statistically significant association with overweight and obesity. Result of current study in lined with result of Dagne S, et al. who reported dietary habits have no statically significant association with overweight and obesity. In contrast to current Darebo T, et al. reported dietary habit alcohol consumption had statistically significant association with overweight and obesity. Regarding snack in take it indicates absence of statistically significant association with overweight and obesity. The result of current study is consistent with finding of Field AE, et al. which report snack intake had no statistically significant association with overweight and obesity. It can be explained that the nature of snacking make difference among participants. Parents monthly income had statistically significant (p<0.05) association with overweight and obesity which is similar with other comparable studies done in Addis Abeba, Hawassa and Dessie. When participants parents income increase overweight and obesity also increase; this might be due to consumption of more food as compare with those from parents in low income. Participants from high income family have greattendency to take more energetic food by using money freedom. Participants from low income family have less chance to be overweight and obese due to inadequate food intake. About 18.6% of study participants were underweighted which indicate still now malnutrition is common problem among adolescents in Ethiopia. Regarding prevalence of overweight and obesity it is low in Ethiopia which can be related with economical shortage of the country.

Conclusion

As compare with other previous local studies prevalence of overweight and obesity is low; it might be due to nutritional and socio-economical difference among study participants. The current study showed that underweight among adult is still common in Ethiopia which can be related with economical insufficiency of the country. Parents average income, gender and climatic condition of respondent had statistically significant association with overweight and obesity whereas snack intake, physical activity, alcohol intake didn't show statistically significant association with overweight and obesity. The finding of this result is important for planning in issue of overweight and obesity and it gives incite to design prevention strategies among university students.

Limitation of the Study

This study did have limitation by its small sample size and the study was concentrated from year one medical students.

Ethics Approval and Informed Consent

Ethical clearance was obtained from research and publication committee of Dire Dawa University, The purposes and the importance of the study was explained to each study participant. Verbal consent was obtained from each study participant.

Consent for Publication

Not applicable

Data Availability

The data sets used during the current study are available from corresponding author on reasonable request.

Funding

Not applicable.

Computing Interest

Author declare that there is no conflict of interest.

Author's Contribution

WN design study, data collection, searching literature, data analysis, data interpretation, report writing, manuscript preparation.

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