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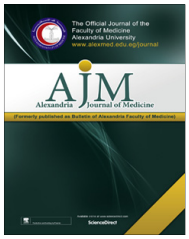

Prevalence and associated risk factors for obesity in Jalalabad city – Afghanistan

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Abstract *Background:* Obesity has become a major global health challenge due to established health risks and substantial increases in prevalence. Being a complex condition it contributes to burden of chronic diseases by affecting virtually all ages and socioeconomic groups. This study aims to identify the prevalence of obesity and blood lipid profile and their associated factors in Jalalabad city, Afghanistan.

Methods and materials: A cross-sectional study was conducted in Jalalabad within May–June 2013. Multistage random sampling technique was used to enroll 1200 adults of 25–65 years. WHO STEP wise approach used to collect data on demographic and behavioral factors. Physical measurement including height, weight and blood pressure was collected and blood samples were drawn in fast condition for biochemical measurements including blood lipids. Obesity was defined and categorized using body mass index. Descriptive and inferential analyses were performed using SPSS v.20.

Results: The overall prevalence of obesity was 27.4% with significant difference between sexes (35.9% females and 16% males). The mean age was 38.76 ± 11.06 years with 60% female, 71.5% illiterate and 6.3% of smokers. Average total cholesterol, high density lipoprotein, low density lipoprotein, and total glycerides were 198.8 mg/dL, 39.2 mg/dL, 122.9 mg/dL and 186.1 mg/dL respectively. Age, sex, education status, use of mouth snuff, rice as a meal, nature of job, diabetes and high blood pressure were significantly associated with obesity.

Conclusion: Approximately one third of adult population in Jalalabad city is suffering from obesity which is a cause of concern. Blood lipid profile is either borderline or more than average among study participants which could contribute to non-communicable diseases. Measures such as raising awareness and lifestyle modifications may help to reduce the burden of obesity among Jalalabad adults.

1. Introduction

Obesity has become a major global health challenge due to established health risks and substantial increases in prevalence.[1] Being a complex condition it contributes to burden of

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chronic diseases by affecting virtually all ages and socioeconomic groups.[2] In 2010, overweight and obesity were estimated to cause 3.4 million deaths, 4% of years of life lost, and 4% of disability-adjusted life-years (DALYs).[3] Worldwide, the proportion of adults with a body mass index (BMI) of 25 kg/m^2 or greater increased between 1980 and 2013 from 28.8% to 36.9% in men, and from 29.8% to 38.0% in women.[1] In developed nations obesity is related inversely to socioeconomic status (SES) affecting disadvantage group.[4] In contrast in developing economies, overweight and obesity tend to affect more people from a high socioeconomic background.[5–7] With the use of Indo-Asian-specific Basic Mass Index (BMI) cutoff values the prevalence of overweight and obesity was 25% and 10.3% respectively.[8] In the Eastern Mediterranean Region obesity and overweight have reached an alarming level. The prevalence of obesity among adolescents ranges from 15% to 45% with more occurrences in women versus men.[9] Moreover a systematic review of published papers between 1990 and 2011 showed that overweight and obesity in all age groups of the EMR countries range from 25% to 81.9%.[10] In an Iranian study the prevalence of overweight, obesity and pathologic obesity was 40%, 35% and 3% respectively.[11] Likewise the prevalence of overweight and obesity was found as high as 46.9% and 28.8% for males and 26% and 27% for females, respectively, in a survey in a relatively affluent country like Cyprus.[12] Using anthropometric measurement, the prevalence of obesity in the United States was found to be 30.5% in a survey conducted from 1999 to 2000 while in the United Kingdom, the prevalence is 23% among men and 24% among women.[13,14]

Many studies have identified different factors that could contribute to the prevalence of overweight and obesity which include greater age, being female, urban residence, being literate, socioeconomic status, intake of meat products[8,11]; dietary habits, physical inactivity[9]; nutrition transition, urbanization, marital status, a shorter duration of breastfeeding, frequent snacking, skipping breakfast, a high intake of sugary beverages, an increase in the incidence of eating outside the home, long periods of time spent viewing television, high fat foods[10]; waist circumference, total serum cholesterol, low density lipoprotein, blood glucose, and triglycerides, lower levels of fruits and vegetables, exercised less time/day and smoke more cigarettes/day[12] and more.

In Afghanistan, due to years of war and conflict, few studies have been conducted to estimate the burden of obesity in the country. Overweight and obesity in age group of boys $<$ 20 years, men $\geqslant$ 20 years, girls $<$ 20 years, and women $\geqslant$ 20 years are estimated to be 18.5%, 49.2%, 19.5%, and 42.6%, respectively, while the obesity alone in same age groups is estimated to be 6.8%, 14.8%, 4.4%, and 13.8% respectively.[1] A study in Badghis province of Afghanistan in 2002 showed that the prevalence of obesity and overweight in female age group of 15–49 years was 1.8% and 11.5% respectively while the mean BMI was 21.1 kg/meter square.[15] In a study in 1997 in children less than 3 years it was showed that the proportion of overweight was 4%,[16] however, according to anecdotal reports of clinicians in Kabul the number of people with obesity is increasing day by day. Currently in Afghanistan, there is lack of reliable information on burden of non-communicable diseases including obesity, blood pressure, cancer, and diabetes due to high priority to infectious diseases while the country is suffering from double burden of diseases. The study may assist in estimating the burden of obesity and risk factors for adult population in Jalalabad city. The information provided will support strategic decisions and public health interventions to control and reduce risk factors and decrease the burden of disease. This study aims to determine the prevalence of obesity indicated by BMI and blood lipid profiles and its risk factors in Jalalabad city.

2. Methods and materials

WHO STEP wise approach[17] was adopted and conducted to determine the prevalence and associated factors for non-communicable diseases including blood lipids and obesity in Jalalabad city, Afghanistan. Jalalabad city is the capital of Nangarhar province located in eastern border of country. Our target population was adult individuals in age group of 25–65 years of both sexes and gave consent to participate. Temporary residents (less than six months) and those living in institutionalized settings along with insecure areas were excluded from the survey. After statistical calculation, totally 1200 subjects enrolled in the study. Data were collected during May–June 2013. All four clusters (A–D) and 20 sub-clusters of expanded program of immunization (EPI) were used for sample selection. The primary sampling unit (PSU) was sub-clusters, the secondary sampling units (SSU) were streets/areas, tertiary sampling units (TSU) were households and ultimate sampling units (USU) were respondent more than 25 years in the household. In cluster A, B, C and D the percentage of study population was 32%, 23%, 22% and 23% accordingly. Cluster A was more populated and more people are drawn but the actual number of population is not available. The interviewer was instructed to find a famous masjid as a fixed landmark or a very populated street within the boundaries of the selected location and following the bottle rotating rule proceed to series of households. In each household interviewer enumerated all persons who were eligible for our study based on inclusion criteria. The households with only one person meeting the eligibility criteria were the designated respondent. For households' more than one person we wrote everyone names on a piece of paper before folding to look similar. Like lottery a member was asked to pick up a paper to select the designated respondent for this survey. The methods provide equal chance of being selected for each member of the households which fulfill the requirement of the survey. Structured and coded questionnaires were used to collect demographic, socioeconomic, clinical and behavioral information during interview. Bath scales were used for determining subjects' body weight. A flexible measurement tape was used to measure height of participants. Height and weight measurements were used to calculate and categorize body mass index (BMI).[18] A tension measurement tape was used to measure the waist circumference in order to identify central obesity.[19] Cuff type sphygmomanometers were used to determine systolic and diastolic blood pressures and later on it was categorized as normal and high blood pressure.[20] We have developed operational definitions to categorize the risk factors in our study. Hypertension was diagnosed if systolic blood pressure was $\geqslant$140 mm of Hg and/or diastolic pressure $\geqslant$90 mm of Hg, or diagnosed cases taking antihypertensive drugs. Pre-hypertension is defined as 120–139 mmHg systolic blood pressure and/or 80–89 mmHg diastolic pressure. Overweight