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ORIGINAL ARTICLE

OverNutrition and Associated Factors among Women of Reproductive Age Group in Jigjiga Town Somali, National Regional State Eastern Ethiopia

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ABSTRACT

Overnutrition is one of the current global public health problem affecting both developed and developing countries with major health and economic consequences for human. In developing countries it coexists with undernutrition. It has reached epidemic proportions globally, with more than 1 billion adults overweight-at least 300 million of them clinically obese. Overnutrition is the major risk factors for type 2 diabetes, heart disease, high blood pressure, and other problems including social, psychological dimension; affecting virtually all ages and socioeconomic groups.The study was intended to determine prevalence of overnutrition and associated factors among women of reproductive age group in jigjiga town Somali national regional state Eastern Ethiopia.Community based cross sectional study design was used. Multistage random sampling method was used to select 762 women of reproductive group in jigjiga town. Data were collected by face-to-face interview using structured pretested questionnaire. Additionally, anthropometric measurements such as weight and height were measured following standard procedure. Bivariate analyses were done to check the association between dependant variables and each independent variable. Odds Ratio along with 95% confidence level was estimated using multiple logistic regression analysis to identify factors associated with overnutrition. The level of statistical significant was set at P-value less or equal to 0.05.Finding of this study revealed that prevalence of overnutritionwas 32.8% (95% CI: 29.3, 36.5) in which 22.4% (95% CI: 19.2, 25.7), 10.4% (95%CI: 8.2, 12.8) were overweight and obese respectively. Overnutrition was significantly associated with vegetable consumption [3.419 95% CI, (1.462, 7.998)], women with parity > 2 [AOR=0.435, 95% CI (0.196, 0.966)], moderate physical activity [2.245, 95% CI, (0.98, 5.10)] and sedentary life [0.192, 95% CI, (0.11, 0.33)]. Overnutrition is rapidly emerging in Jigjiga town. Parity, sedentary life, vegetable and physical activity were among the predictors that were significant with overnutrition. Thus public health intervention and nutrition education in community should address; including behavioral change and dietary activities.

Key words: *Overnutrition, sedentary behavior, parity, jigjiga town, Ethiopia*

INTRODUCTION

Overnutrition is a condition in which the natural energy reserve, stored in the fatty tissue of humans and other mammals, is increased to a point where it is associated with certain health conditions or increased mortality (Sidik, *et al*, 2009). WHO reported in 2008 Overnutrition as one of the major public health problem over the entire world and its prevalence has more than doubled since 1980 (WHO, 2008).

The WHO estimated that by 2005, at least 1.6 billion and 400 million people aged above 15 years were overweight and obese respectively. It further projected that by 2015, these statistics will increase to 2.3 billion for overweight and 700 million for obesity, unless drastic measures are taken to mitigate this burgeoning problem (WHO, 2006). In addition to this WHO, 2010 reported that 1.5 billion adults (20 years and above) were overweight with 300 million females and 200 million males being obese (WHO, 2010). Furthermore data from 138 of 194 countries for which the WHO reports obesity statistics, women were more than 50% more likely to be overnourished than were men (Anne and Alicia 2008).

Overnutrition is the fifth leading causes of global deaths with about three million adults die each year from being overnourished. Furthermore overnutrition was reported as the second leading cause of preventable death after smoking (WHO, 2010). Overnutrition has several health consequences; it is a major risk factor for the global burden of NCDs (WHO, 2006).

The WHO (2006) reported that the rate of increase in the prevalence of overnutrition in developing countries is more rapid than in developed countries, particularly in urban areas. It is currently estimated that 20-50% of urban populations in Africa are either overweight or obese and by 2025, three quarters of the obese population worldwide will be in non-industrialized countries. In West Africa, the rate of obesity is about 10%. It is 3 times higher among women than men. In parts of West Africa, the rates have more than doubled in the last 15 years. In South Africa, more than one in two women are obese. In Morocco, more than 40% of the population is overweight (Lokuruka, 2013).

Ethiopian Demographic and Health Survey (EDHS) of 2011 shows that national prevalence rate of overnutrition is 5% for overweight and 1% for obesity among women, even though prevalence of overnutrition varies from region to region the highest prevalence of overweight is seen in Addis Ababa, Dire Dawa and Somali regions (20%, 19% and 15.9% respectively), compared with 3% of women in Benishangul-Gumuz and Tigray. One woman of every five residing in Addis Ababa and Dire Dawa cities are overnourished (CSA 2012).

Overnutrition plays a major role in causing poor health in women, negatively disturbing quality of life and shortening quantity of life. There is much overnutrition -related conditions, which unique mostly to women. These include: birth defects, infertility and gynecological complications, urinary incontinence, stress and stigma/discrimination (Mbochi, *et al,* 2012). In addition to this overnutrition have been associated with; the development of hypertension, dyslipidemia, type2 diabetes, coronary heart diseases, gallbladder diseases and certain cancers including breast cancer and endometrial cancer (Siega, *et al*, 2004).

OBJECTIVES

General Objective:

- To determine prevalence of overnutrition and identify associated factors among women of reproductive age group in jigjiga town Somali regional state eastern Ethiopia, from February 01 to March 01, 2015.

Specific Objectives:

- To determine the prevalence of overnutrition among women of reproductive age group in jigjiga town
- To identify factors associated with overnutrition among women of reproductive age group in jigjiga town.

METHODOLOGY

Study Area and Study Period:

This study was conducted from February 01 to March 01 2015. in Jigjiga town. There are eleven kebeles in the town. According to jigjiga administrative health office, health facilities found in the Jigjiga town were 3 hospital (1 Referral hospital, 1 Regional hospital and 1 Private hospital), 2 health centers, 15 private clinics and 1 mothers and child health clinic (FDRE, MOH, health & health related indicators 2007) .

Study Design:

A cross-sectional community based quantitative study design was used.

Source Population:

All women of reproductive age groups in Jigjiga town.

Study Population:

All randomly selected woman of reproductive age group in the selected four kebeles, in Jigjiga town.

Inclusion Criteria:

All women of reproductive age group who are permanent dwellers for (six months) in Jigjiga town.

Exclusion Criteria:
Pregnant women, Women with physical disability and those who are unable to respond and communicate appropriately.

Sample Size Determination:
Epi Info version 7 software was used to determine sample size for the difference between population proportions. In this education were the variable used to calculate the sample size with an estimated prevalence among the exposed 42.2% and unexposed 29.3% (Shayo and Mugusi 2011, Sidik*et al* 2009, Anuradha R *et al* 2011). To increase the sample size the power of the study was increased to 80% with the assumption of CI 95%. Hence the calculated sample size is 762 using 1.5 design effect and 10% non response rate. Therefore, this study was conducted on 762 samples since it is greater than the sample calculated from single population

Sampling Procedure:
Multi-stage random sampling method was used, by considering Jigjiga town, which consist of eleven kebeles. Four kebeles were selected from these eleven kebeles by simple random sampling. List of households with women of reproductive age group (15-49) in the four kebeles was established. Seven hundred sixty two households with women of reproductive age group was selected using systematic random sampling technique from households with women of reproductive age group in these four kebeles. In cases where there are more than one eligible individual or women of reproductive age group in the selected household, a lottery method was used to pick one

Data Collection Methods:
The study was used two types of measurement tools: questionnaire and anthropometric tool. Structured questionnaire was used to collect the data; most of the questionnaire was adapted from WHO STEP tool for chronic disease risk surveillance and some modification of the questionnaire was done in accordance with the local situation (WHO STEP, 2010). The questionnaire was divided into three parts: socio-demographic and behavioral such as (dietary intake part, physical activity part, Movement activities, recreational activities and sedentary activity) and the last part was on anthropometry.

Data Collection Procedure:
The data collectors were gone to households that have been identified during sampling and try to contact the eligible persons (all women of reproductive age '15-49 years'). The reason of visit were explained the study subject. The eligible persons were requested to participate in the study. Data was collected using pretested structured questionnaire and anthropometric measurements. The socio-demographic part was asked the respondent about their age, marital status, parity and socioeconomic status. The physical activity part was interviewed; physical activity data, type, frequency, duration and intensity of physical activity during work, transportation and leisure time in a typical week. In addition to this dietary part was asked the respondent such: as frequency of meals, favorite foods, vegetable and fruit consumption etc. Lastly the data collectors were perform height and weight measurement. Height will be measured using standard procedure with a portable height scale to the nearest 0.5cm. Weight was measured using digital scale and recorded to the nearest 0.1kg. The subjects were weighed with minimum of clothing.

Dependent Variable:
Overnutrition (Yes, No).

Independent Variables:
Socio-demographic variables; age, religion, ethnicity, educational level, marital status, parity, dietary habit, physical activity, and socioeconomic status.

Data Quality Control:
The questionnaires was pre-tested a week before the actual data collection days for 10% of the sample size on same sample unit (households) of the study but, in a kebele which is not selected for the study. The original English version of the questionnaire was translated in to Amharic and Somali versions to avoid ambiguity in the concept of the question, and then the local version will be

translated back into English by professional person to check it is consistence and modification will be done accordingly. Data collectors and supervisor was trained by principal investigator; during data collection trained supervisor was checked in the field how the data collectors are doing their task and responsibility. Weight scale was calibrated to 0 daily before starting measurement, both height and weight was measured twice for every subjects in case the two results are different the average of the two were used.

Data Processing and Analysis:

Data was checked for completeness and consistency manually. Data was sorted, coded and entered onto a computer using Epi-data version 3.02 and cleaned by checking for error, impossible or implausible values and inconsistencies that might be due to coding or data entry errors. Data was exported to SPSS version 16 software packages for further analysis. Both descriptive (frequency and percentage) and analytic approaches was used to analyze the data. To ascertain the association; variables found to be significant (P<0.2) in the bivariate analysis were used to construct a multivariate models. Multicollinearity test were carried out to see the correlation between independant variables using correlation test. HosmerLemshow and omnibus test was done to test for model fit. Odds ratio along with 95% confidence interval (CI) were estimated to identify factors associated with Overnutrition while controlling for all possible cofounders using multivariate logistic regression. Level of statistical significant was cleared at P. value less or equal to 0.05.

Ethical Considerations:

The ethical clearance was obtained from Haramaya University institutional Research Ethics Review committee. Official letter of cooperation was written to health institution by college of health and medical science. Written informed consent and assent was obtained from each participant.

RESULTS

1. Socio-demographic Characteristics of Women of Reproductive Age Group:

A total of 698 participants were interviewed with 91.6% response rate. More than half of study participants, 428(61.3%) were married whereas 54(7.7%), 16(2.3%) were widowed and separated respectively. More than two third of respondents 484 (69.3%) were Somali. Of the 555(79.5) study participants were Muslim, 86(12.3%) were orthodox where as 36(5.2%) and 21(3.0%) protestant and catholic in religion respectively. Concerning the literacy majority of study participants, 436(62.5%) were illiterate this may justify their source of income specifies that is why about one third 223 (32%) of the respondent reported that their source of income is from their husbands. (Table 1).

2. Prevalence of OvernutritionAmong Women of Reproductive Age:

Majority of the study participants were normal 67.2% (95%, CI: 63.5, 70.7) and 32.8% (95% CI: 29.3, 36.5) were overnourished in which 22.4% (95% CI: 19.2, 25.7), 10.4% (95%CI: 8.2, 12.8) were overweight and obese respectively (Fig.1).

3. Factors Associated OvernutritionAmong Women of Reproductive Age Group:

A.SociodemographicFactors Associated with Women Overnutrition:

The highest prevalence of overnutrition was observed among women with 3-4 parity 44% [AOR=0.435, 95% CI (0.196, 0.966)], compared to women with 1-2 parity 24.7% and with no parity 23.5% respectively. Furthermore marital status was significant for overnutrition; prevalence of overnutrition were higher among married 37.3% [AOR= 0.228, 95% CI, (0.052, 0.994)] compared single 11.5%.

B. Dietary Habit Factors Associated with Overnutrition:

In Bivariate analysis a significant was observed; snack consumption [COR=2.654, 95% CI, (1.89, 3.72)], fruit consumption days per week [COR=4.879, 95% CI(3.08, 7.73)] and frequency of vegetable consumption. While in multivariate analysis respondant who consume snack were

almost 5 times [AOR=4.642, 95% CI (2.98, 7.24)] more likely to be overnourished as compared those who don't eat snack. Furthermore respondents who consume fruit one day in their typical week were 7 times [AOR=7.460, 95% CI (2.35, 13.56)] more likely to be overnourished than those who don't consume fruit (Table 3).

C. Physical Activity Factors Associated OvernutritionAmong Women:

Both bivariate and multivariate analysis was done and bivariate showed significant for moderate physical activity [COR=2.245, 95% CI, (1.28, 3.95)], vigorous physical activity [COR=14.79, 95% CI, (5.92,36.7)], time spent for vigorous activities [COR=14.79, 95%, CI (5.92,36.7)] and time spent for rest/sitting hours per day [COR= 0.161 95% CI, (0.104,0.25)] were significant associated with overnutrition among women of reproductive age. In multivariate analysis; moderate physical activity was significant associated and revealed women who perform moderate physical activity for more than two days in a week were 2 times [AOR= 2.245, 95% CI (0.98, 5.10) less likely to be overnourished than women who don't engage moderate physical activities (Table 4) .

Table 1: Sociodemographic characteristics among women of reproductive age in jigjiga town, 2015 (n=698)

Variable	Level	Frequency (n)	Percent %
Age (in year) n=698	15 – 25	240	34.4
	26 – 35	251	36.0
	36 – 49	207	29.6
Marital Status n=698	Single	163	23.4
	Married	428	61.3
	Widowed	54	7.7
	Divorced	37	5.3
	Separated	16	2.3
Ethnicity n=698	Somali	484	69.3
	Oromo	69	9.9
	Amhara	125	17.9
	Others	20	2.9
Religion n=698	Muslim	555	79.5
	Orthodox	86	12.3
	Protestant	36	5.2
	Catholic	21	3.0
Educational status n=698	Informal education	436	62.5
	Primary education	86	12.3
	Secondary education	94	13.5
	College and above	82	11.7
Work to earn income n= 695	Yes	254	36.5
	No	441	63.5
Occupation n=695	Casual labor	66	9.5
	Self employed	118	17.0
	Regularly employed	86	12.4
	House wife	252	36.3
	Student	139	20.0
	Others	34	4.9
Source of income n=697	Job salary	145	20.8
	Own business	140	20.1
	Husband	223	32.0
	Remittance	116	16.6
	Others	73	10.5
Monthly Family income n=698	500 – 2000	193	27.7
	2001 – 3000	193	27.7
	3001 – 4500	167	23.9
	>45000	145	20.7
Housing status n=695	Own	245	35.3
	Rented	407	58.3
	Others	43	6.2

Fig.1: Prevalence of overnutrition among women of reproductive age group in jigjiga town, 2015.

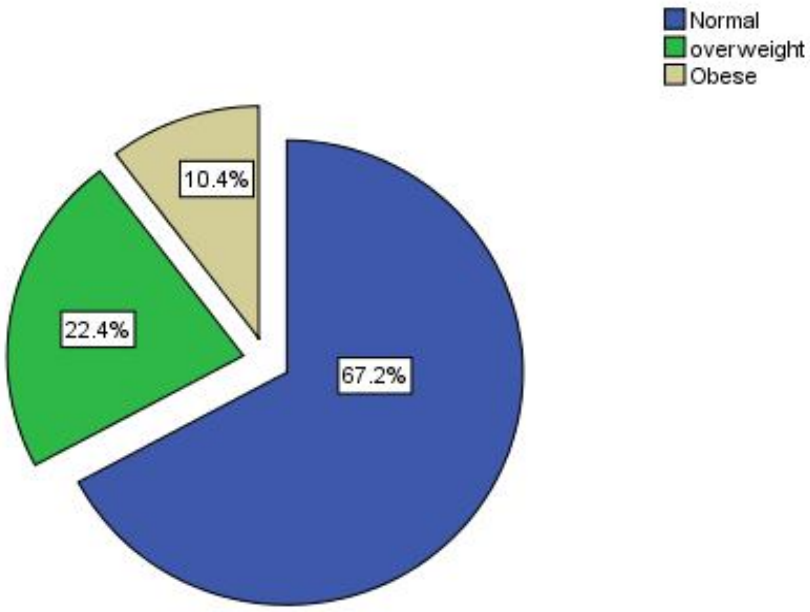

Table 2: Socio-demographic factors associated overnutrition among women of reproductive age in Jigjiga town, 2015

Variable	level	Overnutrition Yes (%)	No (%)	Crude OR	Adjusted OR
Age in years	15 – 25	36(16.7)	180(83.3)	1	1
	26 – 35	98(41.4)	139(58.6)	0.295(0.19, 0.47)**	0.859 (0.423, 1.745)
	36 – 49	78(40.4)	115(59.6)	1.039(0.706, 1.53)	1.299(0.771, 2.188)
Marital status	Single	17(11.5)	131(88.5)	1	1
	Current married	149(37.3)	250(62.7)	0.114(0.034,0.35)**	0.228(0.052, 0.994)*
	Widowed	22(44.0)	28(56.0)	0.521(0.185, 1.47)	0.229(0.060, 0.876)*
	Divorced	16(47.1)	18(52.9)	0.687(0.216, 2.18)	0.345(0.083, 1.425)
	Separated	8(53.3)	7(46.7)	0.777 (00.23,2.68)	0.446(0.101, 1.960)
Educational status	Informal education	163(39.9)	246(60.1)	1	1
	Primary education	19(24.1)	60(75.9)	1.922(1.11, 3.31)*	1.004(0.465, 2.169)
	Secondary education	10(12.5)	70(87.5)	0.918(0.45, 1.89)	0.751(0.293, 1.922)
	College and above	20(25.6)	58(74.4)	0.414(0.18, 0.96)*	0.452(0.165, 1.234)
Parity	No child	64(23.5)	208(76.5)	1	1
	1 – 2 child	22(24.7)	67(75.3)	0.369(0.26, 0.6)**	0.553(0.304, 1.006)*
	3 – 4 child	56(44.8)	69(55.2)	0.422(0.24, 0.75)*	0.435(0.196, 0.966)*
	>4child	70(43.8)	90(56.2)	1.043(0.65, 1.67)	1.079(0.591, 1.969)
Source of income	Job salary	47(34.3).	90(65.7)	1	1
	Owned business	38(29.7)	90(70.3)	2.481(1.213, 5.07)*	2.73 (0.893, 8.349)
	Husband	87(42.0)	120(58.0)	2.006(0.968, 4.16)	1.54(0.469, 5.077)
	Remittance	28(26.9)	76(73.1)	3.444(1.74, 6.8)**	5.146(1.66, 15.99)**
	Others	12(17.4)	57(82.6)	1.750(0.82, 3.74)	2.701(0.88, 8.266)
Occupation	Casual labor	21(35.0)	39(65.0)	1	1
	Self employed	39(33.9)	76(66.1)	3.500(1.07, 11.38)*	4.416(0.855, 22.797)*
	Regularly employed	27(32.5)	56(67.5)	3.336(1.08, 10.24)*	2.150(0.407, 11.364)
	House wife	84(36.8)	144(63.2)	3.134(0.994, 9.88)*	2.262(0.411,12.456)
	Student	35(27.3)	93(72.7)	3.792(1.28, 11.24)*	1.677(0.375, 7.506)
	Others	4(13.3)	26(86.7)	2.446(0.80, 7.51)	2.622(0.590, 11.653)

*= Statisticallysignificant 5% level of significant (P< 0.05, **= P< 0.001, *** P <0.0001)

Table 3: Dieting habit factors associated overnutrition among women of reproductive age in jigjiga town, 2015

Variable	Level	Overnutrition Yes (%)	No (%)	Crude OR	Adjusted OR
Ever had snack	Yes	120(45.6)	143(54.4)	2.654(1.89,3.72)**	4.642(2.98, 7.24)**
	No	92(24.0)	291(76.0)	1	1
No of days per week fruit consumed	No intake	62(58.5)	44(41.5)	1	1
	1 day	70(38.3)	113(61.7)	4.879(3.08,7.73)**	7.460(4.10, 13.56)**
	>2days	80(22.4)	277(77.6)	2.145(1.46,3.16)**	2.480(1.55, 3.97)**
No of days per week vegetable consumed	No intake 1 day intake >2 days intake	62(58.5) 70(38.3) 80(22.4)	44(41.5) 113(61.7) 277(77.6)	1 4.879(3.08,7.73)** 2.145(1.46,3.16)**	1 3.419(1.462, 7.998)* 2.577(1.301, 5.091)
No of serving Vegetable per day	No serving	62(58.5)	44(41.5)	1	1
	1 time serving	131(29.8)	309(70.2)	6.007(3.19,11.3)**	7.421(2.35, 9.48)
	>2 times	19(19.0)	81(81.0)	1.807(1.05, 3.10)*	3.730(2.96, 4.12)

*= Statistically significant 5% level of significant (P< 0.05, **= P< 0.001, *** P <0.0001)

Table 4: Physical activity factors associated overnutrition among women of reproductive age in jigjiga town, 2015

Variable	Level	Overnutrition Yes (%)	No (%)	Crude OR	Adjusted OR
Moderate sport days/wk	0 day	157(35.3)	288(64.7)	1	1
	1 day	38(33.3)	76(66.7)	2.245(1.28, 3.95)*	2.280(1.10, 4.69)*
	>2days	17(19.5)	70(80.5)	2.059(1.07, 3.97)*	2.245(0.98, 5.10)*
Vigorous sport day/wk	0 day	207(39.3)	320(60.7)	14.79(5.92,36.7)**	15.9(2.59, 19.8)
	1 day	5(4.2)	114(95.8)	1	1
Vigorous sport hours/day	0 hour	82(70.1)	35(29.9)	1	1
	1 hour	126(25.1)	375(74.9)	1.954(0.67, 5.72)	0.054(0.001, 2.35)
	>2hours	4(14.3)	24(85.7)	0.02(0.00, 0.16)*	0.001(0.00, 0.07)
Time spent sitting or rest per day	1 hour	26(11.4)	202(88.6)	0.161(0.104,0.25)**	0.192(0.11, 0.33)**
	>2hours	186(44.5)	232(55.5)	1	1

*= Statistically at 5% level of significant (P< 0.05, **= P< 0.001, *** P <0.0001)

DISCUSSION

The study was conducted to view overnutrition and associated factors among women of reproductive age group in jigjiga town. Accordingly, the overall prevalence of overnutrition was 32.8% (95% CI: 29.3, 36.5) in which 22.4% (95% CI: 19.2, 25.7), 10.4% (95%CI: 8.2, 12.8) were overweight and obese respectively. Furthermore women who consume (vegetable) were 3 times [3.419 95% CI, (1.462, 7.998)] less likely to be over-nourished than those who don't consume daily, women with 3-4 parity (44%) [AOR=0.435, 95% CI (0.196, 0.966)] were more overnourished compared to women with 1-2 parity (24.7%) and with no parity (23.5%), in addition to this study revealed that women with moderate physical activity were 2 times [2.245 95% CI, (0.98, 5.10)] less likely to develop overnutrition than women with no physical activity.

The study showed that the prevalence of overnutrition in the study participants was 32.8% in which (22.4% for overweight and 10.4% for obesity) respectively. This prevalence rate of overnutrition is much lower than finding from a study concducted in Iran in which 49.9% for overweight and 25.2% for obese respectively (Janghorbani, *et al*. 2007) and study conducted in Gaza strip 57.0% (El kishawi, *et al*. 2014) and study in Darasalam Tanzanian women in which 19.2% was obese(Shayo and Mugusi, 2011) and study in Ghanian women in which 37.1% for overweight and 27.8% for obese (Benkeser, *et al* 2012). Study finding is almost similar to a study in Benin in which 22.41% was overweight and 10.68% obesity(Adisetu*et al*. 2013). Furthermore the finding is higher a study conducted Tanzania among adult women in which 16% for overweight

and 6% for obese (Keding, *et al*) and study in Bengal India in which 20.3% were overweight (Sen, 2013).

The study finding is much higher or double to EDHS 2011 which is 15.9% of women in Somali region were overnourished. This prevalence difference is due to nutrition transition in Somali region for these five years between 2011-2015; furthermore this higher percentatge of overnutrition among jigjiga town women's might be because of their sedentery life and higher addaptation of unhealthy dietary habit (energy dense foods, sweets, fats etc) and minimum of child spacing meaning increased number of birth per women which lead to women for sedentary life and increased food intake specialy dense energy foods culturally.

Including this study prevalence of overnutirion was increasing with age from 16.7% in the age between 15-25 age groups to 41.4% in the age between 26-35 year age group with [COR=0.295 95% CI, (0.19, 0.47))]. This finding smaller than in a study conducted in Iran 22.3% in the 15-to-24-year age (Janghorbani*et al*. 2007) and study in Ghana among female teachers 51.5% in women above 35years as compared women with age below 25 years only 17.4% (Adisetu*et al*. 2013) and study conducted in Accra Ghana which revealed that ages less than 25 years which is 33.30% for overweight and 11.7% for obesity, where as the highest prevalence of overweight and obesity are seen the ages greater than 35 years which is 75.4% for overweight and 45.6% for obesity respectively (Benkeser. *et al*. 2012) .

One possible expalanation for increament of overnutrition among age greater than 25 years among women's in jigjiga town is because their religious perspective on towards women's participation of recreation activities in addition with this majority of women are married at this age and have at least a child which put them to sedentary life.

Furthermore this study showed that the prevalence of overnutrition is higher among married women compared to single women 37.3% [AOR= 0.228, 95% CI, (0.052, 0.994)] compared single 11.5% respectively which is much lower than a study conducted in Darsalam Tanzania (Shayo and Mugusi, *et al*. 2011) and a study in Iran (janghorbani, *et. al* 2007).

Likewise this study revealed that increased number of parity had significant association with development of overnutrition in which women with 3-4 parity 44% [AOR=0.435, 95% CI (0.196, 0.966)] were more overnourished compared to women with 1-2 parity 24.7% and with no parity 23.5% respectively. The study finding is slightly similar with a study in Tanzania in prevalence of overnutrition is higher among parity of 5 and more 43.0% (Shayo and Mugusi, 2011). Furthermore this finding is slower than study conducted in urban slum in chennai India in which 36% were overnourished (Anurada, *et al*. 2011). Furthermore this finding is much higher than a study conducted in Brazil (Goulart, *et al*. 2007). In addition the study showed that literacy has inverse to the prevalence of overnutrition in which the prevalence of overnutrition is lower women with college and above 25.6% compared to women with no education 39.9% [COR= 0.452 95% CI, (0.165, 1.234)] so, the study finding is somewhat higher conducted in Chennai India (Anuradha*et al*. 2011) whereas the study finding is inverse to a study conducted in Malaysia which reveals prevalence of overnutrition is more common literate women compared to illiterate women (Sidik, *et al*. 2009). The study illustrates that, women who consume (vegetable) were 3 times [3.419 95% CI, (1.462, 7.998)] less likely to be over-nourished than those who don't consume daily. This supports that vegetables is preventive measure for overnutrition. In addition to this finding is comparable to a study conducted in Chennai India less frequently intake of fruits and a vegetable is associated with high risk of overnutrition (Anuradha R. *et al*. 2011), furthermore the finding is supported by study in hawasa which reveals subjects who don't consume fruit were 4.67 times more likely to be overweight than adolescents who eat fruit for more than two times per day (AOR=4.67 [95%CI: 1.76-12.38]) (Teshome, *et al*.2013). Even though in our study fruit day and vegetable are significant but our women are getting more weight so, one possible explanation for higher prevalence of overnutrition in jigjiga's women's tends to zero consumption of vegetables or consume vegetable and fruit as a supplement to the regular meal but not to substitute the regular meal. As result consumption of fruit and vegetable might provide extra calorie.

The study finding revealed that increased sitting per hours has a significant inverse for the development of overnutrition and revealed women's who sit or rest one hour per day were 11.4% [AOR= 0.192, 95% CI, (0.11, 0.33)] % over-nourished as compared women's who sit or rest 2 hours

and more were 44.5% over-nourished. This finding is supported by a study conducted in Chennai India (Anuradha, *et al*. 2011), a study in hawasa (Teshome, *et. al* 2013) and (Mushtaq, *et. al* 2011). In this study moderate physical was significant associated with overnutrition while vigrorous physical activities was not significant is there. Because other researches revealed that physical activity has inverse association for the development of overnutrition. One possible explanation is majority of study participant are Somali because of their religious prospective women are prohibited to participate recreational activities as a result majority of over-nourished in this study are Somali and Muslim in religion.

CONCLUSION

This study revealed that overnutrition is rapidly emerging in Jigjiga town. The prevalence was high among women with 3- 4 Parity [AOR=0.435, 95% CI (0.196, 0.966)] as compared women with no parity, sedentary life, vegetable and physical activity were among the predictors that were significant with women overnutrition.

RECOMMENDATIONS

Here are some measures that are recommended by researchers: -

1. Behavioral changes related to improve lifestyle through increased physical activity practice to Somali region women's affairs to initiate and encourage women to participate recreation activities through boh planned and unplanned physical activities, for example walking or enrolling planned physical activity facilities. For awomen with low socio-economic status and cann't afford the cost of this facilities jogging and walking is enough.
2. Somali regional health bureau should orginize community based health and nutrition advise and education to to improve dietary patterns of the communities for instance giving a training for communities about balanced diet and its importance for the health.
3. Ministry of Health should implement community intervention that provide advice on the issues related life style modification of moderate physical activity and diet practice.
4. Somali regional health bureau should create awareness about unhealthy food consumption and initiate awareness on the issues related overnutrition and its consequences on health and life

LIMITATIONS OF THE STUDY

1. Physical activity is quite difficult and also subjected to error which has potential to skew the data..
2. Pregnant women were excluded by only verbally asking the participant which may not be used as confirmatory.
3. Women with any abdominal mass were not confirmed so it might affect the data.
4. The study was used anthropometric measurement which is prone to measurement errors (both random and systematic error).

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