Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.6135

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **6 (2):** 1134-1141 (2018)

Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Prevalence of Obesity among the Young Girls (18-22 yrs) of Dawoodi Bohra Community in Central Mumbai

Anuradha Shekhar* **and Sakina A Ratlamwala**

Dr. B.M.N college of Home Science.338, Rafi Ahmed Kidwai road, Matunga, Mumbai-19

Affiliated to SNDT Women's University

*Corresponding Author E-mail: shekaranuradha@yahoo.co.in

Received: 30.12.2017 | Revised: 28.01.2018 | Accepted: 5.02.2018

ABSTRACT

The global rise of obesity is a growing concern all over the world, the prevalence of overweight and obesity has increased significantly in almost all the countries in the world, making WHO consider it as a "GLOBAL EPIDEMIC ".Obesity is becoming the most common and serious nutritional disorder amongst the young generation. The reasons behind this are the changing diet, modernisation, inactive lifestyles, and easy living. However there is no data regarding the prevalence of obesity among the young girls of the Dawoodi Bohra Community. The present study was carried out, with a sample of 405 young Dawoodi Bohri Community girls of central Mumbai within the age group of 18-22 years. The background details, anthropometric measurements, dietary pattern, family history, menstrual details, and exercise pattern were studied. A dietary recall was later obtained from a subsample of 58 identified overweight and obese subjects .The subjects were mostly unmarried belonging to well to do nuclear families with no work status. The community had maximum underweight females. Obesity was prevalent in 5% of the sample, however, their body fat percentage based fitness scores showed the trend of 'thin fat' body type. Also there was a significant correlation obtained between BMI and body fat percentage along with waist circumference, hip circumference, waist hip ratio and mid upper arm circumference.

Key words: *Obesity, Dawoodi bhora, Anthropometric measurements, Body fat, Fitness score*

INTRODUCTION

A major problem that India faces today is obesity. Obesity is not just a cosmetic consideration; it is a grim health predicament. It has attained epidemic levels around the world with millions of individuals being detected as overweight or obese [1]. Obesity is characterised by excessive fat deposition leading to serious health consequences like cardiovascular diseases, hypertension, type II diabetes mellitus, impaired glucose tolerance and dyslipidemia, menstrual abnormalities among other problems[2,3,4,5,6] It also poses risk factor for the reduction in average life expectancy[7, 8, 9, 10, 11, 12,13,14].

According to WHO, Obesity is one of the most common nutritional problems all over the world today.

Cite this article: Shekhar, A. and Ratlamwala, S.A., Prevalence of Obesity among the Young Girls (18-22 yrs) of Dawoodi Bohra Community in Central Mumbai, *Int. J. Pure App. Biosci.* **6(2):** 1134-1141 (2018). doi: http://dx.doi.org/10.18782/2320-7051.6135

The prevalence of overweight and obesity has increased significantly in almost all the countries in the world, making WHO consider it as a "GLOBAL EPIDEMIC".

This has lead to rising concern among health professionals. According to WHO, obesity is a multi factorial, chronic disease, a neglected public health problem. Thus the present study was carried out with an objective to find the prevalence of overweight and obesity among young ladies of 18-22 year age group belonging to the Dawoodi Bohra community since there is no data of overweight and obesity prevalence among the youth of the Dawoodi Bohra community.

MATERIAL AND METHODS

The present study was carried out on a sample of 405 young Dawoodi Bohra girls of 18-22 years, residing in the 4 Mohallas (*viz.* Saifee, kutbi, husaini and fatemi areas) of Bhendi bazaar, J.J, and Nagpada areas in Mumbai-3. The research design of the study included screening of overweight and obesity using anthropometric measurements, and a questionnaire was used to obtain information related to their dietary pattern, family history, menstrual details, and exercise pattern. A dietary recall was later obtained from a subsample of 58 identified overweight and obese subjects

The criteria for the selection of the subjects were as follows

Inclusion criteria:-Healthy girls were selected for the purpose with the help of medical professionals.

Exclusion criteria:-Subjects with any disease condition like diseases of the kidney, liver, cancer, etc, patients with diabetes mellitus, pregnant and lactating women were not selected.

Anthropometric measurements of height, weight, were assessed along with the circumference measurements of waist, hip, mid upper arm. The BMI and WHR were calculated for them and classified as per WHO cut offs[15]. Body density and % body fat was calculated using the following equation-

Table 1: Body density calculation formulae for females [16]

Age (yrs)	Calculation
17-19	1.1549-0.0678 log (bicep + tricep + subscaular + suprailiac skin fold)
20-29	1.1599-0.0717 log (bicep + tricep + subscaular + suprailiac skin fold)

Percentage body fat = (495/ body density – 450)[17]. Based on body fat%, the subject were assigned fitness scores as per their body fat percentages [15].

RESULTS AND DISCUSION

The background details obtained from the participants revealed that the mean age of the volunteers involved in the study was 20.03 years. Maximum subjects 49.9% were qualified with a higher secondary certificate. The subject's marital status depicted that 79.3% of them were unmarried. The family type that they resided in showed that nuclear family system was predominant in the community. The work related information results revealed that 82% of the subjects were not involved with any kind of job, and the remaining who were working performed mostly desk jobs. These results clearly signify that the young ladies of the community had more of a sedentary lifestyle 'couch potato lifestyle', which plays a major role for the increase in the number of overweight and obese individuals. The socioeconomic status of the subjects showed a maximum of 45.4% of the subjects falling in the highest income range of above 15000 Rs/month. This revealed that most of the subjects involved in the study came from well to do families.

General anthropometric means for total sample

The anthropometric assessment of 405 young ladies (18-22 year olds) of the Dawoodi Bohra community exhibited the following results

Table 2: Descriptive anthropometric statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	405	18	23	20.03	1.451
Height (cm)	405	14	176	156.28	9.258
Weight (kg)	405	35	90	51.92	10.029
BMI (kg/m^2)	405	14	36	21.26	4.346
Waist Circumference (cm)	405	52.0	109.0	69.938	11.6532
Hip Circumference (cm)	405	72.5	129.2	92.427	9.5570
WHR	405	.61	1.20	.7534	.06865
MUAC (cm)	405	15.2	40.2	24.208	4.9186
Body Density	405	1.019	1.069	1.0455	.010497
% Body Fat	405	13.05	35.77	23.478	4.74735
Fat free mass (kg)	405	28.14	63.31	39.373	5.83318
Total fat mass (kg)	405	4.83	27.19	12.541	4.66846

Anthropometric assessment carried out for all the subjects reported that the mean height and weight of the subjects were 156.28cm and 51.92kg respectively. The WC, HC, MUAC exhibited the following means of 69.93cm, 92.42cm, and 24.20 cm ±4.91cm respectively, all of these means were within the normal range as per the WHO cut offs. Average waist to hip ratio (WHR) was 0.753. The Body mass index of the subjects depicted a mean of 21.26 kg/m^2 which is normal as per both the Asia pacific and WHO cut offs. The mean body density obtained was 1.045. Average fat% of the subjects was 24.478% that fits into the poor category of the fitness scale. The fat free mass in kg and fat mass in kg calculated from the fat % in relation to total body weight, exhibited means of 39.37kg and 12.54kg respectively.

Identification of overweight and obese subjects as per WHO cut off for their BMI showed that 48% subjects were normal, while 32% were underweight. The prevalence of Overweight and obese youth was 15% and 5% of total sample respectively (fig 1.1)

BMI classification- the prevalence of Obesity

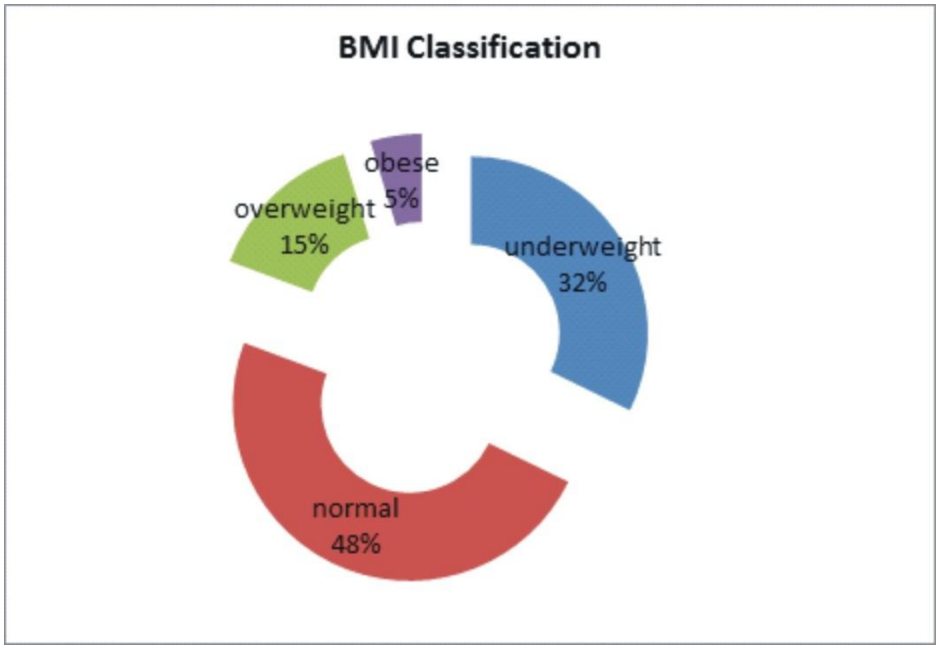

Fig. 1: Classifications of the subjects as per BMI

Fitness Classification based on body fat %

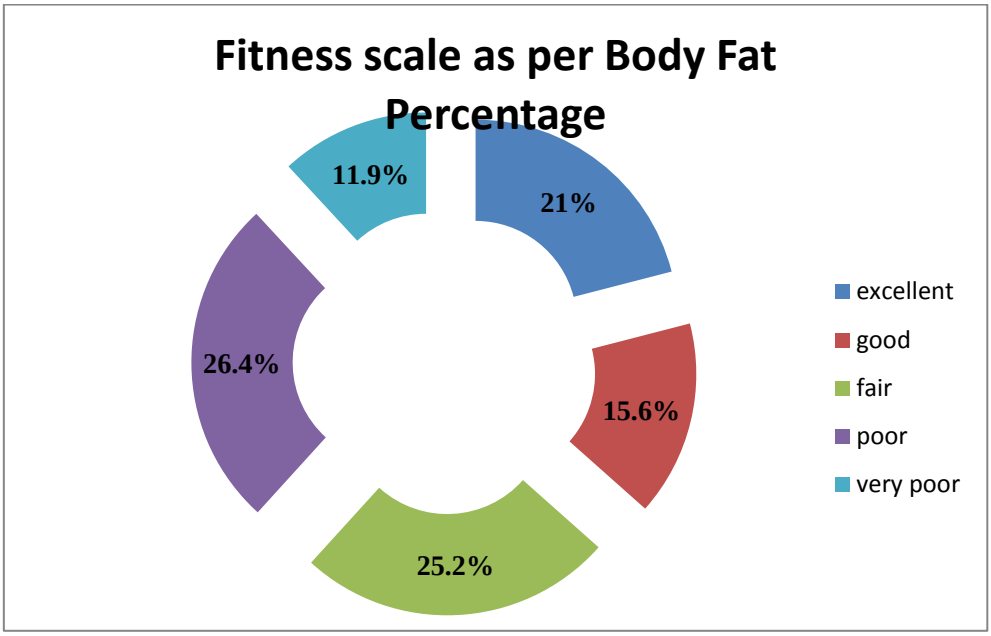

Fig. 2: Classification of subjects as per their Fitness scale based on their body fat%

The data obtained by calculating the body fat percentages of the subjects when classified according to their fitness scales Fig 1.2 revealed that the highest percentage of 26.4% subjects had a poor fat % fitness score and 11.9% of the total subjects belonged to the very poor score category.25.2%, 15.6%, and 21% of subjects were shown to have fair, good and excellent fitness scores.

The data thus reveals that a maximum of 155 subjects of the total sample (N=405) had a fitness score below fair category, thereby indicating that they had poor and very poor fitness levels due to high body fat percentage present in them.

This result obtained supports that most of the subjects fell into the 'thin fat' criteria because in spite of having normal BMI's as depicted in fig 4.1 there was a poor fitness score among the total sample as per fig 1.2. Thus studies which state that Asians Indians have more fat and less lean mass stands true in this case. Also that WHO cut offs [15] overestimates the BMI in Asian population is very well demonstrated from the result obtained[18, 19, 20].

Co-relation of BMI and Fitness scores

The BMI classification and fitness scale categories based on body fat percentage were correlated as represented in table 1.3.

Table 3: Correlation between BMI and fat% based fitness scores

			For BMI				Total
Fitness scores based on fat%			Under-weight	Normal	Over-weight	Obese	
	Excellent	Count	80	4	1	0	85
		% within For BMI	61.1%	2.0%	1.7%	.0%	21.0%
	Good	Count	34	28	1	0	63
		% within For BMI	26.0%	14.3%	1.7%	.0%	15.6%
	Fair	Count	13	86	3	0	102
		% within For BMI	9.9%	43.9%	5.1%	.0%	25.2%
	Poor	Count	3	70	25	9	107
		% within For BMI	2.3%	35.7%	42.4%	47.4%	26.4%
	Very Poor	Count	1	8	29	10	48
		% within For BMI	.8%	4.1%	49.2%	52.6%	11.9%
Total		Count	131	196	59	19	405
		% within For BMI	100.0%	100.0%	100.0%	100.0%	100.0%

The result analysis shows that a maximum of 61.1% (n=80) of the total (n=131) underweight subjects were falling in the excellent fitness category as per their fat percentages. Whereas 26%, 9.9%, 2.3%and 0.8% among the underweight subjects belonged to the good, fair, poor and very poor categories respectively. Amongst the total (n=196) subjects with normal BMI only a minimum of 2% (n=4) had excellent fat percentage fitness score. In spite of having normal BMI maximum subjects (n=86) of this group had a fair fat percentage.14.3% (n=28) of normal BMI subjects were having good fat percentages which is very less in comparison to 35.7% (n=70) with poor fitness. The identified overweight subjects (n=59) had 42.4% (n=25) and 49.2% (n=29) of individuals falling in the poor and very poor categories of fitness respectively. The similar pattern of fitness score was seen among the obese subjects (n=19) with 47.4% and 52.6% of them having poor and very poor fitness as per their fat percentages respectively. Thus the data reveals that, the obese and overweight subjects were having poor fitness as per their total body fat percentages.

Table 4: Chi-Square Test for BMI and fitness score as per fat %

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	384.974(a)	12	.0001
N of Valid Cases	405		

The correlation analysis carried out between the body fat percent based fitness scores and BMI of the subjects revealed a significant co-relation (p =0.001) as depicted in table 1.4

Correlation between BMI and other anthropometric parameters

Table 5: Correlations between anthropometric indices of obesity

		BMI
Waist Circum	Pearson Correlation	.869(**)
	Sig. (1-tailed)	.000
	N	405
Hip Circum	Pearson Correlation	.858(**)
	Sig. (1-tailed)	.000
	N	405
WHR	Pearson Correlation	.570(**)
	Sig. (1-tailed)	.000
	N	405
MUAC	Pearson Correlation	.906(**)
	Sig. (1-tailed)	.000
	N	405

** Correlation is significant at the 0.01 level (1-tailed).

it was revealed that there is a significant correlation ($p<0.01$) between WHR and BMI, WC and BMI, HC and BMI, and MUAC and BMI. Thus these may be successfully used in the determination of obesity and its associated co-morbidities.

The correlations between anthropometric measurements and dietary practice among the identified overweight and obese subsample revealed that increase in BMI, WHR, WC, %BF and decrease in Body density and fat free mass among the obese and overweight subsample was significantly correlated to their high fat consumption per day. The evaluation of the dietary nutrient intake of the obese and overweight subjects clearly exhibited a high calorie and fat intakes than RDA (ICMR 2010).

Menstrual details obtained showed that overweight and obese subjects had an

earlier menarche and menstrual irregularity. The correlation analysis between obesity of the subjects in relation to their familial history of obesity showed a very strong significance. A significant co-relation was also found between increase BMI and PCOS. The physical activity details revealed a low exercise performance among 89.5% of subjects.

Correlations between different anthropometric parameters revealed that there is a significant correlation between WHR, WC, HC, MUAC and BMI. Thus these indices may be successfully used in the determination of obesity and its associated co-morbidities.BMI and socioeconomic status of the subjects showed no significant co-relation. The nature of job demonstrated significant co-relation with BMI supporting increase in risk of obesity due to sedentary lifestyle pattern. The correlations between anthropometric measurements and dietary practice among the identified overweight and obese subsample revealed that increase in BMI, neck circumference, WHR, WC, %BF and decrease in Body density and fat free mass among the obese and overweight subsample was significantly correlated to their high fat consumption per day. This supports that increased high fat, empty calorie consumption in the diet contributes to the increased burden of overweight and obesity.

The dietary pattern details of the youngsters exhibited an average consumption of four meals a day by each of the BMI categories. The trend observed with respect to regularity of meals was max. amongst the normal BMI category subjects, while min was amongst the underweight category. The correlation between the eating out patterns of the participants and various BMI categories indicated a highly significant relationship. The dietary nutrient intake of overweight and obese subsample elicited that average energy intake of the subsample was 1981kcal. This average intake was 4.3% higher than the recommended caloric intake of 1899kcal for a young adult lady having reference weight 55kg as per (ICMR, 2010). The mean fat intake of 26% was reported, which was significantly higher than the RDA. Thus the evaluation of the dietary nutrient intake of the obese and overweight subjects clearly exhibited a high calorie and fat intakes than RDA (ICMR, 2010). This increasing trend of irregularity of meals, eating out frequency, opting for empty calorie junk food items as demonstrated among the youth is contributing to increase in number of obese and overweight youngsters to a great extent.

The clinical assessment of the participants reported no significant results. Menstrual details obtained from these young ladies showed that the mean ages of menarche for underweight, normal, overweight and obese were 13.24, 12.34, 10.76, and 11.32 respectively. The overweight and obese categories comparatively had an earlier menarche than those ladies in the normal and underweight category. The relationship test carried out between obesity and early age of menarche for the present study showed a significant co-relation. Thus, as BMI increased age of menarche decreased. The present study also revealed a similar trend with significant co-relation between obesity and menstrual irregularity.

In terms of family history of obesity among the subjects the obese subjects had a max of 97.4% with family history of obesity. The results of the correlation analysis between obesity of the subjects in relation to their familial history of obesity showed a very strong significance. Thus proving that, obesity risk in an individual increases with family history for the same.

Medical history reported that Maximum of 41.7% of PCOS was seen in the overweight subjects. A significant co-relation was found between increase BMI and PCOS. Thus Lifestyle interventions resulting in weight loss comprise the most successful strategy to improve symptoms of PCOS.

There was a low exercise performance seen in the subjects, with max of 84.19% of the sample not performing any form of exercise in their daily routine. The co-relation analysis between Physical exercise and BMI reported a significant correlation. TV Viewing

was reported as a common free time pursuit. Thus low physical activity and sedentary pass time needs to be dealt efficiently among the youth. Therefore indulging in more active free time pursuits rather than sedentary T.V viewing, computer games should be given importance. Out-door play and sports should be encouraged among the youngsters to improve their fitness and BMI and decrease obesity risk.

CONCLUSION

Thus it can be concluded from the following study that there was a low prevalence of obesity among the young girls of the Dawoodi bohra community in central Mumbai however, their body fat percentage based fitness scores showed the trend of 'thin fat' body type. Also there was a significant correlation obtained between BMI and body fat percentage along with waist circumference, hip circumference, waist hip ratio and mid upper arm circumference.

REFERENCES

1. http://www.who.int/mediacentre/factsheets/fs.311/en/index.httml
2. Hartz A.V., Barboraik P.N., Wong A. The Association Of Obesity Within fertility And Related Menstrual Abnormalities In Women, *International Journal Of Obesity*, 1979: **3:** 59-73, In : Obesity. The Report of The British Nutrition Foundation Task Force, British Nutrition Foundation, Blackwell Science, p 10, (1999).
3. Freedman, D.S., Dietz, W.H., Srivasan, S.R., Bereson G .S. The Relation of Overweight to CVD Risk Factor Among Children And Adolescents: The Bogalusa Heart Study. Paediatrics,1999: **103 (6):** 1175-1182, In : Childhood Overweight What The Research Tells Us, The Centre For Health And Health Care In Schools, School Of Public Health And Health Care Services, The Goerge Washington University Medical Centre, 2005, Retrieved From : http://www.healthin schools.org/sh/obesity fs.asp.
4. Strauss R.S, Childhood. Obesity and Self Esteem, Paediatrics, **105(1):** 1-5, In : Childhood Overweight- Overweight What The Research Tells Us, The Centre For Health And Health Care In Schools, School of Public Health and Health Care Services, The Goerge Washington University Medical Centre, 2005(2000).
5. Freedman, D.S., Kanhe, L.K., Dietz, W.H., Srinivasan, S.R., Berenson, G.S., Relationship of Childhood Obesity To Coronary Heart Disease, Risk Factors In Adulthood: The Bogalusa Heart Study. Paediatrics, **103(6):** 1175-1182, In : Childhood Overweight What The Research Tells Us, The Centre For Health And Health Care In Schools, School Of Public Health And Health Care Services, The Goerge Washington University Medical Centre, 2005, Retrieved From : http://Www.Healthin schools.org/sh/obesity fs.ssp (2000).
6. Must A, Strauss R.S., Risk And Consequences Of Childhood And Adolescent Obesity, Int. J. Obesity, 1999: 23 9suppl12) :S2-S11, In : , In : Childhood Overweight What The Research Tells Us, The Centre For Health And Health Care In Schools, School Of Public Health And Health Care Services, The Goerge Washington University Medical Centre, , Retrieved From : Http://Www.Healthin schools.org/sh/Obesity fs.asp (2000).
7. http://www.who.int/topics/obesity/en/
8. Caceres, M., Teran, C.G., Roriquez, S., Medina, Prevelance of insulin resistance and its association with metabolic syndrome criteria among bolivian chidren and adolescents with obesity, BMC Pediatr, Aug: **12(8):** 31 (2008).
9. Velasquez-Mieyer. Neira.C, Nieto.R and Cowan. P,: obesity and cardio metabolic syndrome in children, their advantage cardiovaso disadvantage. Pediatric Review,**1:** 61, (2007)
10. Villa- Roel.C, Buitrago .A, Prevalence of metabolic syndrome in scholars from Bucaramanga, Colombia: a population based study. Pediatric, 1471-2431-9-28.

Retrieved from: http://www.biomedcentral.com/1471-2431/9/28 (2009).

11. Weiss, R., Dulfour, S., Taksali, S.E., Tamborlane, W.V., Petersen, K.F., Pre diabetes in obese youth: a Syndrome of impaired glucose tolerance, severe insulin resistance, and altered myocellular and abdominal fat partitioning. *Lancet*, **362(95):** 951-957 (2003).
12. US department of health and human Services and The US Department of Agricuture, (2005).
13. Haslam, D.W., and James, W.P. Obesity. Lancet, **366 (9492):** 1170-209. Retrieved from: http://www.ncbi.nim.nih.gov/pubmed/1698769 (2005).
14. Hill, A.J., Silver, E.K, fat, friendliness and unhealthy: A year old children's perception of body shape and stereotypes, TNT. J. Obesity, **19:** 423-430. In : Global trends of childhood obesity .Long term consequences, James W.P.T., Annals Nestle 2011; 53-59
15. Durnin, J.V.G.A. and Womcrsley, J., Body fat assessed from total body density and its estimation from skin fold thickness: measurement on 481 men and women aged from 16-72 years. British Journal .Nutrition, **32:** 77-97(1974).
16. Siri, W.E., "body composition from fluid space and density: analysis of methods". In: Techniques for measuring Body composition, J. Brozek and A. Henschel (eds).Washington, D.C.: *National academy of sciences*, p.223-244 (1961).
17. Sen Ray, K., Iqbal, R., Body Composition: Terms And Techniques, **1:** 1-5, In: Methodologies For Fitness Assessment, *Anne Books Pvt. Ltd* (2010).
18. Anthropometry procedures manual, National health and nutrition examination survey, Retrieved from; http ://www.cdc.gov/NCHS/data/nhanes_01_02/body_measures_year_pdf.(2000).
19. Yajnik C.S., Symposium On 'Adipose Tissue Development And Programming Of Adult Obesity' Obesity Epidemic In India: Intrauterine Origins? *Proceedings Of The Nutrition Society*, **63:** 387-396, (2004).
20. Misra, A., Pandey, R.M., Ramadevi, J., Sharma, R., Vikram, N.K., Khanna N., High Prevalence Of Diabetes, Obesity And Dyslipidemia In Urban Slum Population In Northern India. *International Journal Of Obesity* , **25 (11):** 1722-9 **(**2001).