UNDESIRABLE BODY MASS INDEX PROFILES IN YOUNG ADULTS: NO ONE IS IMMUNE TO OBESITY EPIDEMIC IN PAKISTAN

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ABSTRACT

Objective: *To determine the prevalence of underweight, overweight and obesity in young adults aged 17-24 years.*

Materials and Methods: *This cross sectional, descriptive study was conducted in the Department of Physiology, Nowshera Medical College, Nowshera from June 2019 to November 2019 on 124 students aged 17-24 years. The participants were recruited in the study through random, consecutive sampling. After obtaining informed consent, the participants were subjected to measurement of height, weight and BMI for categorization as underweight, normal weight, overweight and obese as per WHO criteria.*

Results: *The mean age of the subjects was 20.70+ 1.42 years. The study group included 73 males & 51 females. 66.9 % of the participants had normal weight, 5.6 % were underweight while a significant 27.5% were found to be overweight or obese without any significant gender difference.*

Conclusion: *33.1 % of the participants had undesirable BMI profile with obesity being commoner than underweight. No significant difference was noted between genders.*

Keywords: *Undesirable BMI profile, Underweight, Overweight, Obesity, Young adults, NMC.*

INTRODUCTION

The world exhibits quite a polarity in terms of nutritional status and provision of adequate nutrition in different populations across the globe. On one extreme, the World Health Organization declares obesity as an emerging epidemic in many parts of the globe[1] and yet at the same time, laments and seeks mobilization of resources to overcome the various forms of under-nutrition in children.[2]

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As per WHO statistics as of 2018, 1.9 billion adults are overweight or obese while 462 million are underweight. Similarly, 52 million children under 5 years of age are wasted, 17 million are severely wasted and 155 million are stunted, while 41 million are overweight or obese.[2]

All the forms of malnutrition i.e. stunting, wasting, underweight, and overweight and obesity are associated with well-established consequences and are largely preventable. Obesity significantly increases the risk of hypertension, diabetes mellitus, asthma and other respiratory problems, sleep disorders, liver disease and psychological problems such as low self-esteem. The hazards of under-nutrition are evident from WHO report that links around 45%

of deaths among children under 5 years of age to under-nutrition.[2]

Pakistan like many other parts of the world is facing a "double burden" of malnutrition[4, 5] where under-nutrition coexists with overweight and obesity within the same community and even the same household. This makes the situation quite challenging for the policy makers.

While the World Health Organization commits the world to ending all forms of malnutrition by 2030, including overweight and obesity,[2] and to reduce premature deaths from non-communicable diseases by one third by 2030, it is pertinent to have a fair idea about the magnitude of the problem in selective age groups to help identify the target population.

Malnutrition has been a subject of considerable debate and research in Pakistan but there is relative scarcity of data on the prevalence of various forms of malnutrition in youth. Unfortunately, many of the research articles take into account the 20-60 years age bracket as adults and therefore, mask the true prevalence in selective age groups. According to available data, 20.9% of Pakistani population comprises of young adults aged 15-24 years.[6] The known association of obesity in childhood and adolescence with a higher risk of adult obesity and with premature death and disability due to non-communicable diseases[3, 7] coupled with the high productivity and such a high contribution of this age group to overall population necessitates evaluation particularly in this age group.

MATERIALS AND METHODS

This cross-sectional, descriptive study was conducted on 124 students of Nowshera Medical College; Nowshera aged 17-24 years. During the study period of June 2019 to November 2019, a total of 124 students were enrolled in the study through random, consecutive sampling. After obtaining informed consent, the participants were subjected to measurement of height, weight and Body Mass Index (BMI) for categorization as underweight, normal weight, over- weight and obese as per WHO criteria8 as under:

Under weight: BMI ≤ 18.5kg/m²

Normal weight: BMI (18.5-24.9 kg/m²)

Pre-obese/overweight: BMI (25-29.9 kg/m²)

Obesity class-I: BMI (30-34.9 kg/m²)

Obesity class-II: BMI (35-39.9 kg/m²) and

Obesity class-III: BMI (> 40 kg/m²)

Data was compiled and analyzed using SPSS version 22. Descriptive statistics were used for categorical variables and frequencies and percentages were presented in tables and charts. Variables with p-value of less than 0.05 were declared as statistically significant.

RESULTS

The demographic and anthropometric characteristics of the study population are shown in Table 1 and 2.

Of the total 124 participants, there were 73 males & 51 females. The mean age of the participants was 20.70± 1.42 years. The mean BMI was 23.22 ± 3.32 kg/m2. Among the participants, 66.9 % had normal BMI, 5.6 % were underweight while a significant 27.5% were found to be overweight or obese without any significant gender difference.

DISCUSSION

Our study aimed at determining undesirable BMI profiles among young adults aged 17-24 years and found potentially alarming results. About one third (33.1%) of the study population had undesirable BMI profiles. Though the prevalence of underweight was relatively low (5.6%), overweight and obesity were noted in a significantly higher proportion (27.5%) of the study population.

Table: 1 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age (Years)	124	17	24	20.70	1.426
Height (cm)	122	144	205	164.32	10.771
Weight (Kg)	123	37.0	125.0	62.717	11.9015
Body Mass Index	122	16.58	35.00	23.2299	3.32463
Valid N (listwise)	121				

Table: 2 Prevalence of Underweight, Overweight and Obesity

		Frequency	Percent
Valid	Under weight	7	5.6
	Normal weight	83	66.9
	Pre-obese	28	22.6
	Obesity class-I	3	2.4
	Obesity class-II	1	.8
	Obesity class-III	2	1.6
	Total	124	100.0

Table: 3 Prevalence and gender distribution of Underweight, Overweight and Obesity

			SEX		Total
			Male	Female	
Obesity	Under weight	Count	3	4	7
		% of Total	2.4%	3.2%	5.6%
	Normal weight	Count	49	34	83
		% of Total	39.5%	27.4%	66.9%
	Pre-obese	Count	16	12	28
		% of Total	12.9%	9.7%	22.6%
	Obesity class-I	Count	3	0	3
		% of Total	2.4%	.0%	2.4%
	Obesity class-II	Count	1	0	1
		% of Total	.8%	.0%	.8%
	Obesity class-III	Count	1	1	2
		% of Total	.8%	.8%	1.6%
Total		Count	73	51	124
		% of Total	58.9%	41.1%	100.0%

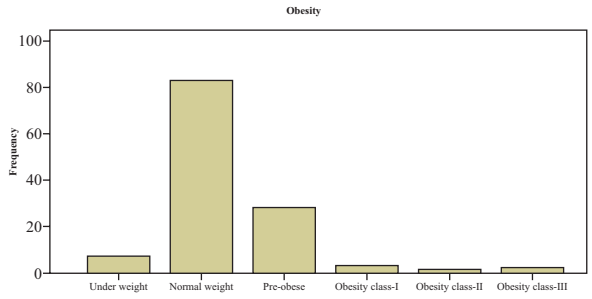

Fig 1: Frequency of Underweight, Overweight and Obesity

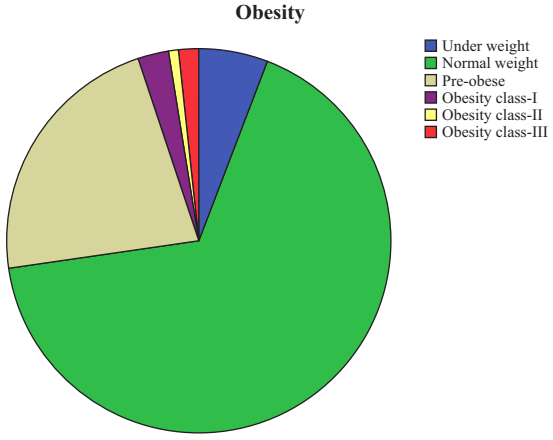

Fig 2: Frequency of Weight profiles according to BMI

Among those with BMI above normal range, vast majority were found to fall in the pre-obese category (82.35 %, n=28) without any statistically significant difference between males and females. The mean BMI of the study participants was 23.22± 3.32 kg/m2. It was difficult to compare the results with other studies due to a difference of study design adapted by local and international studies focusing on adult population as a whole. A study from Gilgit[9] reported a comparable 26% prevalence of obesity in comparable age group of 18-30 years with significantly higher prevalence in females than in males (63% vs. 37%). Such a difference in gender distribution may be partly

explained by the fact that the participants in our study being medical students share a similar life style and level of activity. Similarly, a group of researchers from urban Karachi[10] reported a 15% prevalence of overweight in young adults aged 18-24 years. Such a lower prevalence rate may be solely because of a difference in the study population. A study from nearby malakand division[1] though reported a much higher overall prevalence of 37.02% and 42.17% for overweight and obesity respectively. The same study however; revealed a much lower prevalence of 5.94 % among young adults aged 15-25 years with a mean BMI of 28±1.3 kg/m2.

A study on medical students of similar age group from Peshawar showed that 16.2% of the students were obese and 15 % were overweight with both being more common in males than in females.[11] The net high prevalence in this study may be explained by the use of "modified BMI cut-offs for Asian population"[12] which use lower cut offs for defining overweight and obesity (overweight: BMI ≥ 23 kg/m2, obesity: BMI ≥ 27 kg/m2).

The 2018 National Nutrition Survey of Pakistan (NNS 2018)[13] provides a valuable reference about the prevalence of overweight and obesity in Pakistan. NNS 2018 shows that in Khyber Pakhtunkhwa region, more adolescent girls (10-17 years) are overweight compared to their male peers (15.3 % and 14.7% respectively) while adolescent boys are bit more likely to be obese as compared to adolescent girls (11.9 % and 8.5% respectively). Similarly, there is progressive increase in the prevalence of overweight and obesity in women of reproductive age (15-49 years) with 28.2 % and 15.0 % of them being overweight and obese respectively. Our study results cannot be compared with these statistics due to use of different age groups in NNS 2018 however; the results are roughly comparable.

In 2006, the Metroville Health Study[14] from urban Karachi reported higher prevalence rates of overweight and obesity among women in the comparable age group of 18-30 years (20.0 % and 11.1% respectively) as compared to their male counterparts (12.5 % and 4.7% respectively). Higher prevalence in our study may be attributable to the increasing urbanization and sedentary lifestyle and changing dietary practices over the last 15 years.[4]

Our results also compare favorably with studies from neighbor South Asian countries. A study from urban Hyderabad city of India[15] revealed 13.2 % and 22.5 % of the female subjects in comparable age group of 18-25 years to be overweight and obese respectively while 11.5 % and 23.0 % of male subjects were overweight and obese. A difference in the prevalence may be partly explained by difference in population and the use of modified BMI cut offs for Asians in the aforementioned study. Similarly, a study from Nepal[16] in the comparable age group of 15-19 years reported a higher prevalence in females of both overweight and obesity ((15.5 % vs. 5.0 % respectively) than in males (6.5 % and 4.9% respectively). Such a lower prevalence may be due to difference of the study population.

The West seems to be particularly stormed by the obesity epidemic. Statistics from USA[17] in the comparable age group of 16-19 years reveal a prevalence of 20.5%, 9.5 % and 4.5 % for overweight, class-1 and class-2 obesity respectively with a slight male predominance in all the categories.

Of the total 124 participants, 5.6% (n=7) were found to be underweight (BMI ≤ 18.5 kg/m2) with a slight female predominance. It shows partial concordance with results of the 2018 National Nutrition Survey of Pakistan (NNS 2018) which reported a prevalence of 6.2 % and 13 % in adolescent girls and boys (10-19 years age group) in the Khyber Pakhtunkhwa region. A lower prevalence particularly among boys in our study may be partly explained by the level of education and higher social class of the study population. The difference in gender distribution however; remains unexplained. Similarly, Pakistan Demographic and Health Survey 2017-18 reported a significantly higher prevalence of 18.6 % of underweight among females aged 15-19 years.[18] Such a disparity of results again may be attributed to the higher educational and social status of our study population.

CONCLUSION

One third of the participants (33.1 %) had undesirable BMI profile with obesity being significantly commoner than underweight. While the WHO criteria for classification of obesity on the basis of BMI significantly underestimates the true magnitude of the problem and there is increasing consensus in favor of using lower BMI cut offs for Asian population,[12] the true prevalence may be many fold higher.

Secondly, the position statement of World Obesity Federation on obesity as a chronic, relapsing and progressive disease[19] adds to the overwhelming anxiety about the fate of those affected. The consequences therefore; need to be foreseen, seriously considered and appropriately attended.

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