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Research Article

**A CROSS-SECTIONAL RESEARCH TO ASSESS THE ONSET
OF HYPERTENSION & OBESITY FACTORS AMONG
MEDICAL STUDENTS IN CORRELATION WITH
ATTRIBUTING FACTORS**¹Dr. Miada Ulfat, ²Dr. Taskeen Zahra, ³Dr. Muhammad Jafar Awan¹WMO THQ Kharian District Gujrat²Allama Iqbal Medical College Lahore³Allama Iqbal Medical College**Abstract:**

Objective: It is well-established fact that Obesity and hypertension are correlated. People get weight due to an imbalance of energy and it is disturbing several ethnic strata e.g. age and socioeconomic status. Hypertension is the very cause of obesity. Defensive methodologies for obesity may present a low cost approach to bring down the B.P. To resolve the rate of obesity on the repost of BMI and waist-to-hip ratio and its relationship with hypertension among medical students.

Methodology: We designed a descriptive cross-sectional research in the department of physiology of Sir Ganga Ram Hospital, Lahore (December 2016 to July 2017). Two hundred and thirteen students of first-year MBBS & BDS participated. We recorded the waist and hip circumference, height, weight, BMI and waist-to-hip ratio.

Result: In (213) students, 54.5% (116) were female and 45.5% (97) were male. In observed 8 (6.9%) females and 2 males (2.1%) were below Weight. Fifty-five males (56.7%) and fifty-two females (44.8%) were of standard weight. The occurrence of being overweight in female and male was twenty-two (19.0%) and seventeen (17.5%). Occurrence in obese-I in male and female was twenty (20.6 %) and twenty-three (19.8%) and Obese-II was three (3.1%) and eleven (9.5%) respectively. BMI and WHR indicate, Obesity occurs more in female than male. Hypertension was found in (12) standard weight, (6) overweight's, (14) obese-I and (7) in Obese-II students. There is a significant correlation between body mass index, waist circumference and waist-to-hip ratio and systolic BP and Diastolic BP.

Conclusion: Many students are obese. Our research depicts the strong +ve correlation among body mass index, waist circumference and waist-to-hip ratio and systolic BP and Diastolic BP. Research shows that an increase in Hypertension due to the increase in body mass index.

Keywords: Diabetes Mellitus, Body Mass Index (BMI), Obesity, Hypertension, Waist circumference and Waist-Hip Ratio (WHR).

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INTRODUCTION:

Obesity or being over-weight is state of having an unnecessary amount of fat that collects in our body [1]. It is a well-known type of malnourishment that occur in both developed and developing countries. Above one billion and five hundred million individuals are obese in the world [2]. Globally obesity has established a problem with ever increasing occurrence and about 2/3 of grown-up people are obese [3]. Obesity's pervasiveness in Pakistan is 22% – 37% [4]. Due to the unhealthy way of life chance of getting Diabetes, hypertensions, as well as cardiovascular disorders are increased [5]. Obesity has the prospect in the growth of Hypertension [6]. Anti-hypertensive medicines are used to treat the patients of arterial hypertension. In the Initial discovery of obesity and its treatment can avoid the harmful effects of CVS illnesses.

Around 1 Billion people suffer from hypertension and its occurrence is on the rise in emerging nations. Hypertension has around multiple times higher pervasiveness in the obese than in non-obese subjects [8]. Stomach obesity emerges as a new problem in obesity. Obesity is linked to heart diseases [9]. Anthropometric estimation of abdominal obesity like waist measure, a waist-to-hip percentage have a strong correlation with obesity than BMI [10]. Moreover, obesity is the leading cause of atherosclerosis, AFib, renal failure cerebrovascular & coronary blood vessel illness and cardiac arrest. Not only the medicine but complete change of work style helps in dealing with obesity. Lowering of weight may act as the technique to decrease the risk of hypertension [11].

In recent past use of fast food is enhanced and trend of eating fruits & vegetable and fibre foods are declined. Screen use time is augmented in young cohort. Lacking active physical lifestyle is the cause of diabetes, Hypertension and obesity, this is the main reason behind death and disability. Forty percent collegiate are obese and that is quite shocking, of these students, many are oblivious about the risk factors of obesity [12]. Only 8.5% of collegiate take recommended proportion of vegetable as well as fruits. Majority of the collegiate don't follow diversity in their food plan. Owing to genetic proneness to obesity Pakistanis are very susceptible to it [13].

By using body mass index, waist-to-hip ratio and waist in the age cohort of (18 – 21) of medical pupils the association were observed with Hypertension. Selection of this age cohort is because they are on the verge of conversion into the middle age. Medical

students were selected to serve this purpose. Due to the workload of studies, these students are less involved in any bodily movement and hence to the obesity chances are increased. As medical students have to go through the immense medical studies and in future, they are to treat people it is extremely mandatory to set a check on their weight.

METHODOLOGY:

We designed a descriptive cross-sectional research in the department of physiology of Sir Ganga Ram Hospital, Lahore (December 2016 to July 2017). Two hundred and thirteen students of 1st year BDS and MBBS participated in the present study. Permission form ethical review panel and institutional review panel was taken, and consent form signed from participants. A form is used to obtain Information about the demographics like gender, age, address, identity numbers and cell phone no. obesity was measured by taking student's height in cm and weight in kgs with the help of stadiometer. For taking the precise measurement height and weight shoes and extra clothing were removed respectively. Body mass index was calculated. Students were divided as normal weight, underweight, obese-I, obese-II and overweight. Obesity around the abdomen is determined by waist circumference (WC) and waist-to-hip ratio (WHR). Midriff measurement was taken at the midpoint between iliac peak and lower fringe of rib cage and average of three measurements were obtained. The circumference of the hip was measured greater than the level of the trochanter and two centimetres below and above its calculation. We measured the waist-to-hip ratio by dividing with a circumference of the hip. International Diabetic Federation (IDF) gave advice for the waist-to-hip ratio for South Asia's people are, Men > 90 cm, Women > 80 cm and Cut off value waist-to-hip ratio for female and male is ≥ 0.90 cm (M); ≥ 0.85 cm (W) [15].

Mercury Sphygmomanometer and stethoscope were utilized to obtain B.P. for five mins Subjects were asked to relax by sitting. BP was measured first from the right arm and then from left arm while subjects were sitting. We heard 1st and 5th KOROTK off sound for systolic and diastolic measurements correspondingly. We take two measurements with a gap of 2 mins and then averaged it. Students were divided into groups on the base of BP, normal hypertension, stage 1 & 2 hyper-tension [16].

SPSS was run for the analysis. Quantitative variables e.g., diastolic and systolic BP, WC, Weight, BMI, WHR, Height were shown as (Mean \pm S.D). qualitative variables e.g., sex, obesity and HTN were

shown in percentage and frequency. Value ≤ 0.05 is considered as significant for correlation. Pearson Correlation found the correlation between obesity and BP.

RESULTS:

In (213) students, 54.5% (116) were female and 45.5% (97) were male. In observed 8 (6.9%) females and 2 males (2.1%) were below Weight. Fifty-five males (56.7%) and fifty-two females (44.8%) were of standard weight. The occurrence of being overweight in female and male was twenty-two (19.0%) and seventeen (17.5%). Occurrence in obese (I) in male and female was twenty (20.6%) and twenty-three

(19.8%) and Obese (II) was three (3.1%) and eleven (9.5%) respectively. BMI and WHR indicate, Obesity occurs more in female than male. Hypertension was found in (12) standard weight, (6) overweight students, (14) obese-I and (7) in Obese-II students. There is a significant correlation between body mass index, waist circumference and waist-to-hip ratio and systolic BP and Diastolic BP. Mean \pm SD of weight was (64 ± 12.99) kg, height among medical students was (165.5 ± 9.357) cm, HC was (129 ± 97) cm, WC was (118 ± 84) cm, WHR (0.96 ± 0.8696) , BMI (35 ± 23.31) , DBP (78.83 ± 10.30) and SBP (138.54 ± 13.90) .

Table – I: Comparison of study variables between male and female students

Male (97) / Female (116)	Gender	Mean	SD	P-Value
Height (cm)	Male	173.747	5.7803	0.357
	Female	158.72	5.4591	
Weight (Kg)	Male	69.412	12.5098	0.470
	Female	59.603	11.6722	
Waist Circumference (cm)	Male	86.24	7.062	0.057
	Female	83.62	9.186	
Hip Circumference (cm)	Male	96.43	7.241	0.152
	Female	98.45	8.963	
Body Mass Index (Kg/m ²)	Male	22.9199	3.39985	0.043
	Female	23.6431	4.3738	
Waist to Hip Ratio	Male	0.8942	0.02664	0.000
	Female	0.8489	0.04277	
Systolic Blood Pressure (mmHg)	Male	125.9	13.54	0.648
	Female	113.88	12.906	
Diastolic Blood Pressure (mmHg)	Male	83.45	10.467	0.000
	Female	74.96	8.431	

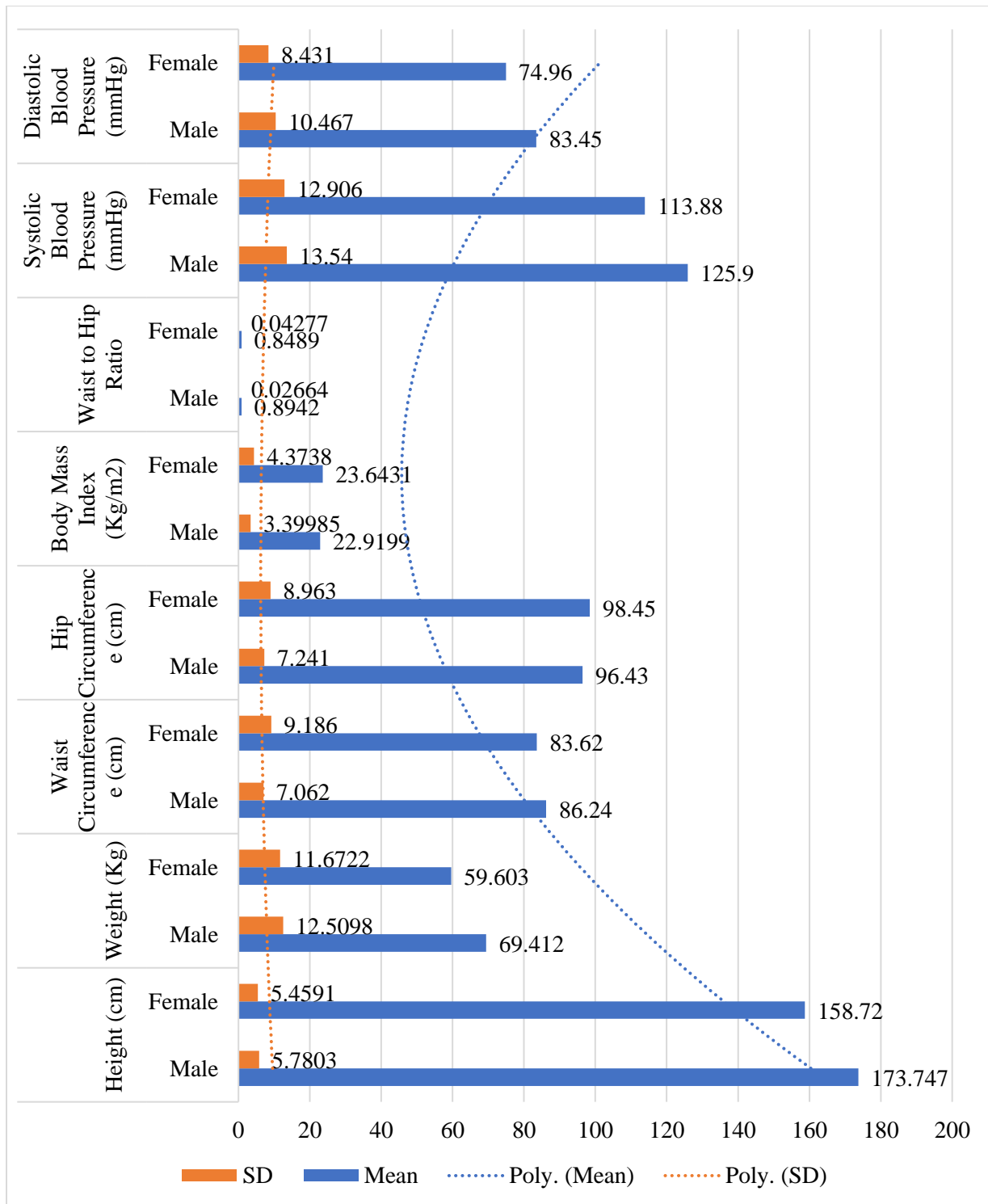


Table – II: Prevalence of general and central obesity in male and female students

Group		Male		Female		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
BMI Group	Underweight	2	2.1	8	6.9	10	4.7
	Normal Weight	55	56.7	52	44.8	107	50.2
	Overweight	17	17.5	22	19	39	18.3
	Obese - I	20	20.6	23	19.8	43	20.2
	Obese - II	3	3.1	11	9.5	14	6.6
WHR Group	Non-Obese	66	68	64	52.2	130	61
	Obese	31	32	52	44.8	83	39

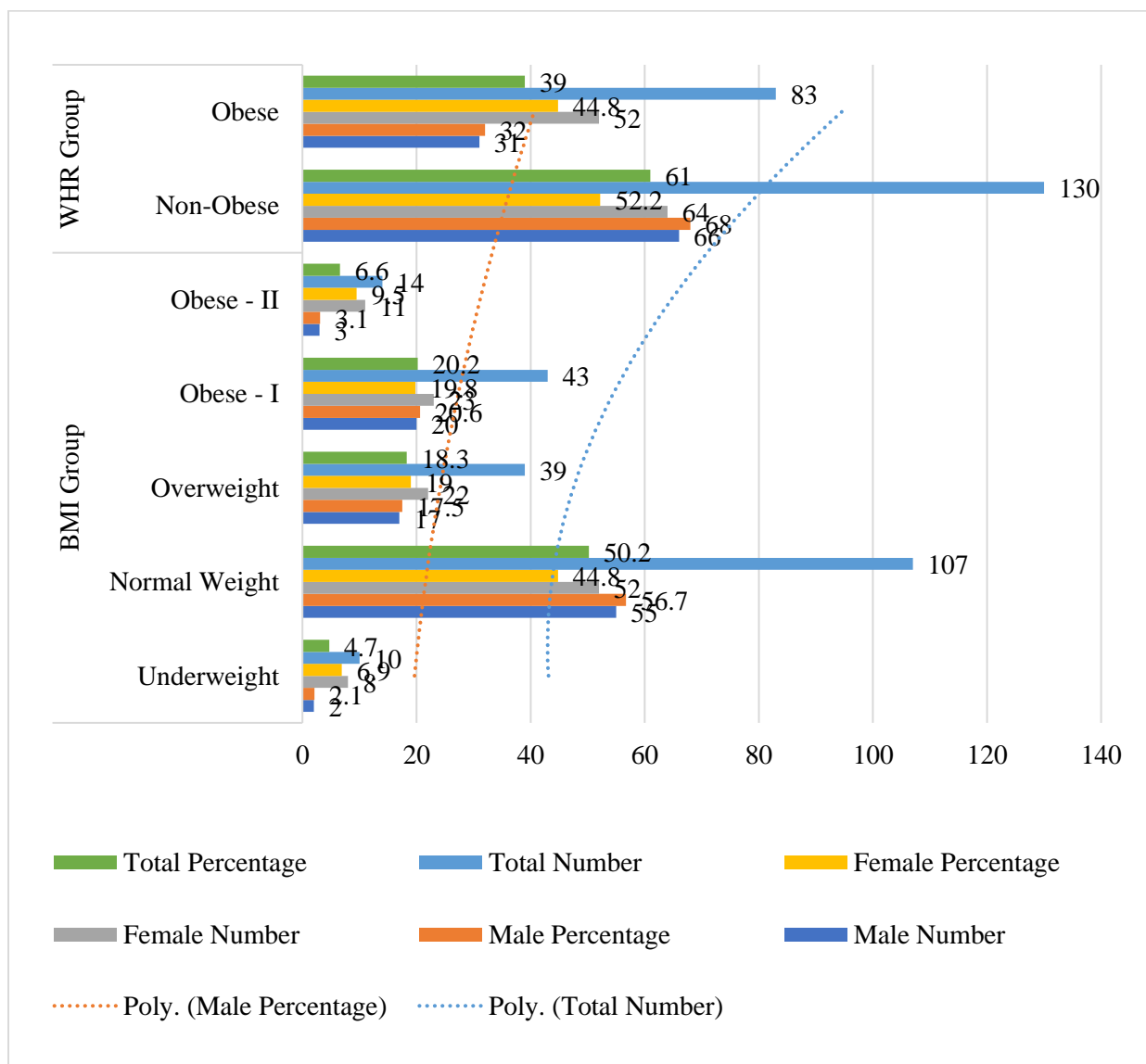
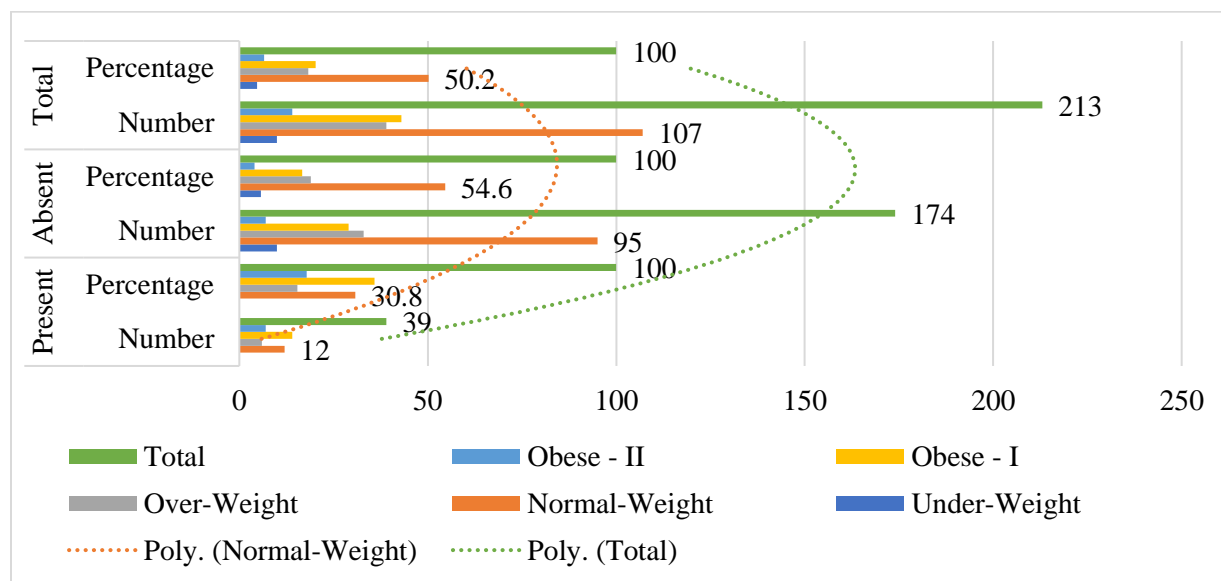


Table – III: Prevalence of Hypertension on the basis of obesity by BMI

BMI Group	Present		Absent		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Under-Weight	0	0	10	5.7	10	4.7
Normal-Weight	12	30.8	95	54.6	107	50.2
Over-Weight	6	15.4	33	19	39	18.3
Obese - I	14	35.9	29	16.7	43	20.2
Obese - II	7	17.9	7	4	14	6.6
Total	39	100	174	100	213	100

**Table – IV:** Correlation of BMI, WC and WHR with systolic-diastolic blood pressure

Details		Systolic Blood Pressure (mmHg) (N = 213)	Diastolic Blood Pressure (mmHg) (N = 213)
BMI Group	Pearson Correlation	0.375	0.351
	Sig (Two-Tailed)	0.000	0.000
Waist to Hip Ratio	Pearson Correlation	0.250	0.265
	Sig (Two-Tailed)	0.000	0.000
Waist Circumference (cm)	Pearson Correlation	0.372	0.374
	Sig (Two-Tailed)	0.000	0.000

For comparison purpose variables of research amid female and male students t-test (independent) was incorporated. The mean \pm standard deviation of Body Mass Index, Waist-to-Hip Ratio (WHR) and Waist Circumference (WC) in men and women were (22.91 ± 3.3) and (23.6 ± 4.37) Kg/m^2 ($P = .043$), (89 ± 0.02) and (0.84 ± 0.04) ($p = 0.00$), (86.24 ± 7.06) and (83.62 ± 9.186) cm ($P = .057$). The mean of SBP and DBP in men and women was (125.90 ± 13.540) and (113.88 ± 12.906) ($P = .648$), (83.45 ± 10.467) and (74.96 ± 8.431) ($P = 0.00$).

DISCUSSION:

In Pakistan researches conducted in recent past highlights the occurrence of over and undernutrition. From childhood to adulthood the change is very much important owing to the fast growth rate. Medical students are more prone to obesity owing to an inactive way of life. For this reason, measuring the frequency of over-weight, obese and underweight in youth is vital, because it helps to cater illness and deaths. Students of 1st year BDS and MBBS were used to check the occurrence of hypertension and obesity. On the guidelines of south Asian obesity students were separated in groups on the base of (WHR, WC, BMI) in non-obese and obese (17). These measurement acts as indicators of cardiovascular diseases (CVS).

Consistent with (NHSP), Mean BMI was 21.7 kg/m² for female and 20.9 kg/m² for male while in this study Mean (BMI) in male was 22.9 kg/m² and in female was 23.6 kg/m² which is a little higher than (NHSP) (18). The occurrence of weight was (19.6%) for female and (13.5%) for male, which is consistent with our research, whereas under-weight population was (25%) in (NHSP) which is higher than our study in which occurrence of underweight was (4.7%). A wide-ranging research conducted on Pakistani people, the occurrence of underweight, overweight and obesity was 11%, 14%, 2.2%, correspondingly. Shams N *et al* researched on female medical students and there were underweight, 62 (20%), 47 (15%) overweight and 78 (25.4%) obese female students [19]. This difference among these reading is due to the change in eating habits of youngsters. Very high prevalence 39 % of central obesity found in medical students of our study. Waist-To-Hip Ratio indicates that there were 52 (44.8%) obese female and 31 (32%) obese male. Research by Bertsias G depicted the occurrence of central obesity as (13%) [20, 21]. Afzal M indicated a prevalence of 12.3% in his study which are lesser than our study. As shown by our study WHR, WC and BMI have a strong positive correlation with diastolic and systolic BP, that confirmed that rise in (BMI) leads to a rise in hypertension. Need of prevention along with a check on weight and obesity is consistent with our study findings, highlight that measurement of Blood Pressure (BP) and weight and in-time diagnosis and control are vital for obese and overweight individuals.

CONCLUSIONS:

Our study concluded that medical students are obese, and this is highly correlated with hypertension. Hypertension was significantly higher in the male than female whereas obesity was more noticeable in

the female. It was concluded that there should be a check on medical student's lifestyle and that encourage sedentary lifestyle which is the cause of obesity. Modification in lifestyle with the help of guideline about the diet should be provided to the students. Use of medicines to control obesity can be applied. Being over-weight as well as under-weight is the problem among medical students. Under-weight students are asked to take balanced diet plan for the improvement of BMI. Obese students were asked to adopt a lifestyle that includes regular exercise and with healthy food for avoiding any problem.

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