The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/18.4396

ORIGINAL PROF-4396

# OVERWEIGHT AND OBESITY;

## SOCIO-DEMOGRAPHIC FACTORS AND DISEASES CAUSING OVERWEIGHT AND OBESITY AMONG 25-60 YEARS WOMEN IN LAHORE, PAKISTAN

**Rukiya Tariq[1], Maryam Shahid[2], Kalsoom Tariq[3]**

1. M.Phil. Public Health, Department of Public Health, University of the Punjab.
2. MBBS Woman Medical Officer, The Children Hospital and The Institute of Child Health, Lahore.
3. BDS Demonstrator, Fatima Memorial Hospital College of Medicine and Dentistry, Lahore.

**Correspondence Address:**
Rukiya Tariq
Department of Public Health,
University of the Punjab.
rukiyatariq17@gmail.com.

**Article received on:**
07/10/2017
**Accepted for publication:**
25/01/2018
**Received after proof reading:**
04/05/2018

**ABSTRACT.... Objectives:** To investigate socio-demographic factors and diseases causing overweight and obesity among 25 to 60 years women. **Study Design:** Descriptive cross-sectional study. **Duration & Setting:** Comprised of five months (January 2016 to May 2016); concerning household survey i.e. door to door sampling method was carried out in Lahore, Pakistan. **Material and Methods:** Multistage sampling technique was used and 3239 women aging 25 to 60 years; of which 1684 (52%) females were normal weight (excluded from the research) and 1555 (48%) overweight/obese women i.e. 1106 (34%) were overweight and 449 (14%) women were obese (included in the analysis).Descriptive statistics and Bivariate logistic regression was applied on the achieved data through IBM SPSS Statistics Version 21. **Results:** Socio-demographic factors and diseases were found significantly associated with overweight and obesity; includes age (p=0.001), marital status (p<0.000), level of education (p=0.000), occupation (p=0.000), father/husband occupation (p=0.000) and monthly income (p=0.001); whereas, diseases such as hypothyroidism (p=0.001), polycystic ovarian syndrome (p=0.000), menstrual period (p=0.001) and depression/stress (p=0.000)as their p-values were less than 0.05 (significant). **Conclusion:** The research findings points out notable explanation of socio-demographic factors and diseases causing overweight and obesity among 25 to 60 years women with respect to which the study can definitely summarized to countless extent.

**Key words:** Socio-Demographic Factors, Diseases, Overweight, Obesity, Women.

**Article Citation:** Tariq R, Shahid M, Tariq K. Overweight and obesity; socio-demographic factors and diseases causing overweight and obesity among 25-60 years women in Lahore, Pakistan. Professional Med J 2018; 25(5):719-727.
**DOI:**10.29309/TPMJ/18.4396

## INTRODUCTION

In modern eras, the increased pervasiveness of overweight and obesity poses noteworthy threats to both health and well-being of many inhabitants; thus signifies a major challenge for health facilities.[1] In United States, the pervasiveness of obesity increased from 15.0% to 30.9% between 1980 and 2000[2] in which 40% males and 28% females 20-74 years of age were overweight whereas, 21% males and 22% females were found as obese.[3] Several studies had also revealed that high occurrence of obesity occurs in women above 50 years of age.[4,5,6]

Similarly, obesity and socioeconomic status was also evaluated at different levels of education.[7,8] Females in low and high income groups were found more obese i.e. 31.8% and 13.6% as compared to 30.5% and 7.4% low and high income groups overweight females.[9] After marriage weight gain is obvious;[10,11] and high body mass index was found among married women as compared to females living alone.[12,13,14] According to Gunderson[15] abnormal weight was also witnessed among woman's reproductive age. Furthermore, women education, residence, gravid and parity were also found considerably allied with an amplified menace of overweight and obesity.[16,17] Among diseases such as hypothyroidism[18] also causes increase gain of body weight. Polycystic ovarian syndrome[19] causes infertility among females at reproductive age. Menopause is also one of the critical periods in the life of woman causing overweight and obesity but the manifestation of obesity was more than overweight women.[20] A notable association was also found between depression, anxiety and obesity among 3004 women aged 25-74 years having history of using antidepressants.[21]

## MATERIALS AND METHODS

Descriptive cross-sectional study concerning household survey i.e. door to door sampling method was carried on overweight and obese women 25 to 60 years in Lahore, Pakistan. The research adopted multi-stage sampling technique and was completed in five months (from January 2016 to May 2016). Lahore is divided into ten towns which was further grouped into several union councils and from each union council two neighboring localities were randomly selected and explained as follows;

- Sadar Bazar and Badian Road from the Aziz Bhatti Town
- Tufail Road and Sarwar Road from Lahore Cantt
- Gulshan Ravi and Muzang Chungi from Data Gunj Bakhesh Town
- Gulberg III and Model Town from Gulberg Town
- Johar Town and Wapda Town from Allama Iqbal Town
- Cavalry Ground and DHA from Nishtar Town
- Bhatti Gate and Kashmiri Bazar from Ravi Town
- Allama Iqbal Town and Muslim Town from Samanabad Town
- Baghbanpura old and Shadbagh from Shalimar Town
- Darogh Wala and Rivaz Garden from Wagha Town.

A structured questionnaire was prepared in English language which was further translated into Urdu (local) language. In questionnaire, women (25 to 60 years of age) were asked about their socio-demographic profile which includes name, age, marital status, women education, women occupation, father/husband occupation and monthly income with their weight and height using weighing scale and retractable steel measure tape ruler as well as diseases causing overweight and obesity such as hypothyroidism, polycystic ovarian syndrome, menstrual period and depression/stress. Before commencement of data collection, pretesting of questionnaire was also done in order to know whether questions are comprehensible to respondents and they could reply them completely.

Normal weight, pregnant and lactating women falling between 25 to 60 years age group as well age of women below 25 and above 60 years were excluded from our study whereas; overweight and obese were observed thoroughly after random sampling. Due to allocation of time 128 houses were visited from one town among which 1-2 women per house were interviewed for the result tabulation. Therefore, visited 1280 houses from 10 towns; the estimated women should range from 1280 to 2560 but, study findings found only 1555 overweight/obese (1106 overweight and 449 obese) women. Formerly written informed consent was taken from all the overweight and obese women (25 to 60 years) after providing sufficient information related to the study. During study it was also ensured that privacy and anonymity of all participated women was maintained and will remain confidential in future.

## RESULTS

Socio-demographic factors and diseases with overweight and obesity among 25 to 60 years women.

The socio-demographic factors (age of women, marital status, women level of education, women occupation, father/husband occupation and monthly income) as well as diseases (hypothyroidism, polycystic ovarian syndrome, menstrual period and depression/stress) with overweight and obesity among 25 to 60 years women were presented in Table-I.

Among socio-demographic factors; age is divided into four age groups having mean age and standard deviation was 42.5 ±10.5. Overweight women between 25 to 33 years were 218 (20%), 34-42 years were 327 (29%), 43 to 51 years were 389 (35%) and 52 to 60 years were 172 (11%), whereas, in obese women, 25 to 33 years were 77 (17%), 34-42 years were 140 (31%), 43 to 51 years were 186 (41%) and 52 to 60 years were 46 (10%). From Table-I, it was cleared that maximum overweight women were in age group of 43-51 years and minimum were in 52-60 years age group. Whereas, the same ratio occurs was in obese category.

| Characteristics | Overweight (n=1106) Overweight (%) | Obese (n= 449) Obese (%) | Total (%) |
|---|---|---|---|
| **Age (years)** | **Mean ± Standard Deviation 42.5 ± 10.5** | | |
| 25-33 | 218 (20) | 77 (17) | 295 (19) |
| 34-42 | 327 (29) | 140 (31) | 467 (30) |
| 43-51 | 389 (35) | 186 (41) | 575 (37) |
| 52-60 | 172 (11) | 46 (10) | 218 (14) |
| **Marital Status** | | | |
| Married | 646 (58) | 249 (55) | 895 (58) |
| Unmarried | 164 (15) | 61 (14) | 225 (14) |
| Widowed | 180 (16) | 84 (19) | 264 (17) |
| Divorced | 116 (10) | 55 (12) | 171 (11) |
| **Level of Education** | | | |
| Illiterate | 499 (45) | 170 (38) | 669 (43) |
| Matric / under matric | 281 (25) | 92 (20) | 373 (24) |
| F.A or Equivalent | 125 (11) | 108(24) | 233 (15) |
| B.A or Equivalent | 110 (10) | 61 (13) | 171 (11) |
| M.A. or Equivalent | 6 (6) | 15 (31) | 78 (5) |
| M. Phil. and above or Equivalent | 28 (2) | 3 (1) | 31 (2) |
| **Occupation** | | | |
| Housewife | 488 (44) | 177 (39) | 665 (43) |
| Govt. Employee | 146 (13) | 101 (22) | 247 (16) |
| Private Employee | 342 (31) | 116 (26) | 458 (29) |
| Unemployed | 130 (12) | 55 (12) | 185 (12) |
| **Father/Husband Occupation** | | | |
| Businessman | 526 (48) | 170 (38) | 696 (45) |
| Govt. Employee | 224 (20) | 95 (21) | 319 (20) |
| Private Employee | 325 (29) | 141 (31) | 466 (30) |
| Unemployed | 31 (3) | 43 (10) | 74 (5) |
| **Monthly Income** | | | |
| 10,000-25,000 | 270 (24) | 41 (9) | 311 (20) |
| 26,000-40,000 | 286 (26) | 76 (17) | 362 (23) |
| 41,000- 55,000 | 272 (25) | 92 (20) | 364 (24) |
| 56,000-70,000 | 193 (17) | 107 (24) | 300 (19) |
| More than 70,000 | 85 (8) | 133 (30) | 218 (14) |
| **Thyroid imbalance** | | | |
| Yes | 171 (15) | 62 (14) | 233 (15) |
| No | 935 (85) | 387 (86) | 1322 (85) |
| **Polycystic ovarian syndrome** | | | |
| Yes | 62 (6) | 47 (10) | 109 (7) |
| No | 1044 (94) | 402 (90) | 1446 (93) |
| **Menstrual period** | | | |
| Regular | 489 (44) | 188 (42) | 677 (44) |
| Irregular | 464 (42) | 163 (36) | 627 (40) |
| Stopped | 153 (14) | 98 (22) | 251 (16) |
| **Depression/Stress** | | | |
| Often | 411 (37) | 157 (35) | 568 (37) |
| Sometimes | 542 (49) | 211 (47) | 753 (48) |
| Never | 153 (14) | 81 (18) | 234 (15) |

**Table-I Socio-demographic characteristics and diseases causing overweight and obesity (N= 1555)**

Among marital status, 646 (58%) overweight and 249 (55%) obese women were married respectively, 164 (15%) overweight and 61 (14%) obese women were unmarried, 180 (16%) overweight and 84 (19%) obese women were widowed and 116 (10%) overweight and 55 (12%) obese women were divorced. Maximum rate of overweight and obesity was in married women and lowest rate of overweight and obesity in divorced women.

Illiteracy is the greatest evil of our society because of which people cannot understand their health problems and social realities. From the Table-I, it was cleared that highest rate of overweight (499 (45%)) and obesity (170 (38%)) was in the illiterate people whereas, the lowest rate of overweight (28 (2%)) and obesity (3 (1%)) was in the M. Phil (or above) qualified persons i.e. education matters a lot in an individual life as compared to overweight and obese women who have level of education matric/under matric (281 (25%) and 92 (20%)), F.A or Equivalent (125 (11%) and 108 (24%)), B.A or Equivalent (110 (10%) and 61 (13%)) and M.A or Equivalent (6 (6%) and 15 (31%))respectively.

During the research, it was also observed that maximum overweight (448 (44%)) and obese (177 (39%)) women were housewives whereas, lowest occurrence of overweight (130 (12%)) and obesity (55 (12%)) was observed among women who were unemployed as compared to overweight and obese women who were government employees (146 (13%) and 101 (22%)) and private employees (342 (31%) and 116 (26%)) respectively.

The resources of food intake for a businessman's family were more and least for an unemployed person. Therefore, overweight 526 (48%) and obesity 170 (38%) were seen more in women of businessman father/husband and least in women (overweight 31 (3%) and obese 43 (10%)) of unemployed father/husband as compared to overweight and obese women whom father/husband were government employees (224 (20%) and 95 (21%)) and private employees (325 (29%) and 141 (31%)) respectively.

Monthly income was divided into 5 categories for the research; overweight (286 (26%)) maximum in the monthly income range of Rupees 26,000 -40,000 and minimum (85 (8%)) in the monthly income more than Rupees 70,000 as compared to overweight women having monthly family income 10,000-25,000 (270 (24%)), 41,000-55,000 (272 (25%)) and 56,000-70,000 (193 (17%)) respectively. Obesity was maximum 133 (30%) and minimum 41 (9%) in more than Rupees 70,000 and Rupees 10,000-25,000 monthly income families respectively as compared to families having monthly income 26,000-40,000 (76 (17%)), 41,000-55,000 (92 (20%)) and 56,000-70,000 (107 (24%)) respectively.

Among diseases, 171 (15%) overweight and 62 (14%) obese women complained about their thyroid imbalance whereas, 935 (85%) overweight and 387 (86%) obese women do not have any thyroid problem. In addition, polycystic ovarian syndrome, 62 (6%) overweight and 47 (10%) obese women have been diagnosed with cyst in ovary. Out of 1446 (93%) overweight/obese women; 1044 (94%) overweight and 402 (90%) obese women have not ever been diagnosed with cyst in ovary.

Maximum number of overweight 489 (44%) and 188 (42%) obese women had regular menstrual period whereas, 464 (42%) overweight and 163 (36%) obese women reported irregular menstrual period and 251 (16%) overweight/obese women had stopped menstrual period. Depression/stress was divided into three categories, 568 (37%) women said that they often felt stress, of which 411 (37%) women were overweight while 157 (35%) were obese, 753 (48%) women said that they sometimes felt stress, of which 542 (49%) women were overweight while 211 (47%) were obese and 234 (15%) women said that they never have stress or felt stress, of which 153 (14%) women were overweight while 81 (18%) were obese. In the second category women, watch TV to forget their worries or troubles for some time at least. In addition, in the state of depression, person eats more which ultimately lasts in overweight/ obesity.

Association of socio-demographic factors and diseases with overweight and obesity among 25 to 60 years women.

The association of socio-demographic factors and diseases with overweight and obesity were shown in Table-II. The highest odd ratio was observed among 52-60 years age group (2.256 (1.798 - 2.836)), married women (2.043 (1.812 - 2.390)), polycystic ovarian syndrome (1.997 (1.688-2.422)) and depression/stress (2.440 (1.982 - 2.808)). Whereas, among obese women, high odds ratio were observed among illiterate (2.967 (2.728 - 3.481)), housewives (2.276 (1.771 - 3.205)), father/husband occupation as businessman (2.505 (1.922 - 2.754)), having monthly income more than 70,000 (2.575 (1.932 - 2.829)), thyroid imbalance (1.768 (1.315-2.376)) and disturbance in menstrual period (1.972 (1.722- 2.842)).

The results concluded from above Table-II, that significant associations were found between socio-demographic factors and diseases with overweight and obesity. Among socio-demographic factors such as marital status, level of education, occupation and father/husband occupation have p-values 0.000, whereas, age group and monthly income have p- values 0.001; whereas, diseases such as polycystic ovarian syndrome and depression/stress have p-values 0.000; thyroid imbalance (hypothyroidism) and menstrual period have p-values 0.001.

## DISCUSSION

Clearly, socio-demographic factors are related to overweight and obesity in many populations,[22,23] thus the findings in this study show significant associations between age, marital status, level of education, occupation, father/husband occupation as well as monthly income with overweight/obesity and goes to buttress this point. Age has been established as a very important predictor of overweight and obesity among 25 to 60 years old women. The study findings were confirmed by Abdeen and authors [24]that the percentages for overweight and obesity increase with age. This is consistent with several studies that have showed a similar relationship between increasing prevalence of weight gain and obesity with age.[25,26]

Among marital status, statistical significant relationship was observed with overweight and obesity having $p<0.000$ in which 895 (58%) overweight/obese women were found as married as compared to unmarried (225 (14%)), divorced (171 (11%)) and widowed (264 (17%)), which may imply that marital status of women was likely to have an influence on their body mass index. This finding conforms from study conducted in Multan[27] who found a high degree of overweight and obesity among married women as compared to single women (unmarried, divorced and widowed). The positive relationship between marital status and overweight, obesity can be explained by the fact that people, after marriage have less physical activities, change their dietary pattern, may be less focused on being attractive, have more social support, or may be exposed to other environmental factors whereas, unmarried women may intentionally manage their weight in an effort to be more attractive to potential marital partner.

The study also showed that socio-economic status of the women was based on her level of education, occupation (women and father/husband occupation) and monthly income; consistent with the finding of other studies that women social class and father/husband social class were much stronger predictors of overweight and obesity.[28,9] Further research was carried out and interest was focused on factors that may explain the relationship of socio-economic status with overweight and obesity and found similar findings with the research study.[29]

Among diseases causing overweight and obesity; hypothyroidism was significantly associated with increase body weight. Various researchers have studied the effect of the thyroid hormones on body mass index and it has been demonstrated that explicit thyroid dysfunction affects body weight.[30,31] Overweight and obesity also showed significant association with polycystic ovarian syndrome. Variation in body weight between polycystic ovarian syndrome populations in USA

| Characteristics | Odds Ratio (OR) 95% Confidence Interval | | P- value |
|---|---|---|---|
| | Overweight | Obese | |
| **Age Group (years)** | | | |
| 25-33 | reference | reference | |
| 34-42 | 1.857 (1.676 - 2.087) | 1.148 (1.071 - 1.572) | |
| 43-51 | 1.947 (1.756 - 2.186) | 1.533 (1.281 - 2.093) | 0.001 |
| 52-60 | 2.256 (1.798 - 2.836) | 1.966 (1.795 - 2.181) | |
| **Marital Status** | | | |
| Married | 2.043 (1.812 - 2.390) | 1.966 (1.578 - 2.123) | |
| Unmarried | reference | reference | |
| Widowed | 1.428 (1.285 - 1.741) | 1.384 (1.248 - 1.593) | 0.000 |
| Divorced | 1.968 (1.674 - 2.338) | 1.801 (1.638 - 2.134) | |
| **Level of Education** | | | |
| Illiterate | 2.366 (1.866 - 2.414) | 2.967 (2.728 - 3.481) | |
| Matric/under matric | 2.112 (1.830 - 2.276) | 2.436 (2.220 - 2.887) | |
| F.A or Equivalent | 1.926 (1.773 - 2.223) | 1.971(1.835 - 2.315) | |
| B.A or Equivalent | 1.709 (1.542 - 2.059) | 1.775 (1.645 - 2.165) | |
| M.A. or Equivalent | 1.308 (1.045 - 1.720) | 1.560 (1.293 - 1.926) | 0.000 |
| M. Phil. and above or Equivalent | reference | reference | |
| **Occupation** | | | |
| Housewife | 1.915 (1. 616 - 2.797) | 2.276 (1.771 - 3.205) | |
| Govt. Employee | 1.336 (1.028 - 1.735) | 1.496 (1.330 - 1.746) | |
| Private Employee | 1.608 (1.464 - 2.338) | 1.934 (1.593 - 2.472) | 0.000 |
| Unemployed | reference | reference | |
| **Father/Husband Occupation** | | | |
| Businessman | 2.195 (1.861 - 2.368) | 2.505 (1.922 - 2.754) | |
| Govt. Employee | 2.134 (1.779 - 2.286) | 2.052 (1.705 - 2.147) | |
| Private Employee | 1.830 (1.531 - 2.197) | 1.852 (1.603 - 2.598) | 0.000 |
| Unemployed | reference | reference | |
| **Monthly Income** | | | |
| 10,000-25,000 | reference | reference | |
| 26,000-40,000 | 1.377 (1.042 - 1.820) | 1.991 (1.341 - 2.174) | |
| 41,000- 55,000 | 2.168 (1.489 - 2.093) | 2.290 (1.696 - 2.321) | |
| 56,000-70,000 | 2.239 (1.541 - 2.139) | 2.318 (1.863 - 2.467) | 0.001 |
| More than 70,000 | 2.474 (1.706 - 2.683) | 2.575 (1.932 - 2.829) | |
| **Thyroid imbalance** | | | |
| Yes | 1.621 (1.280 - 2.196) | 1.768 (1.315 - 2.376) | 0.001 |
| No | reference | reference | |
| **Polycystic ovarian syndrome** | | | |
| Yes | 1.997 (1.688 - 2.422) | 1.551 (1.250 - 1.849) | 0.000 |
| No | reference | reference | |
| **Menstrual period** | | | |
| Regular | 1.691 (1.129 - 2.245) | 1.873 (1.505 - 2.309) | |
| Irregular | 1.875 (1.615 - 2.592) | 1.972 (1.722 - 2.842) | 0.001 |
| Stopped | reference | reference | |
| **Depression/ Stress** | | | |
| Often | 1.654 (1.483 - 2.073) | 1.597 (1.350 - 2.258) | |
| Sometimes | 2.440 (1.982 - 2.808) | 1.862 (1.524 - 2.408) | 0.000 |
| Never | reference | reference | |

**Table.II. Association of socio-demographic characteristics and diseases causing overweight and obesity (N= 1555)**

and Europe attributed to genetic and lifestyle factors have also been reported recently.[32] The evidence also showed that even normal weight subjects suffered from polycystic ovarian syndrome have increased intra abdominal fat.[33]

Interestingly, the proportion of women with regular menstrual cycles also suffered from overweight and obesity. Some investigators reported higher rates of menstrual disorders in overweight/obese patients,[34] and others did not identify differences in body mass index between women with regular, irregular/stopped menstrual cycles[35] and in other reports that women with regular menustral cycles were more obese than those with irregular mensutral cycles.[36]

Several cross-sectional studies suggested a positive association of depression/stress with individual weight gain[37] and others observed either inverse or null relationships.[38] The study also revealed a similar finding which coordinately links depression/stress with overweight and obesity in the study subjects. In the study, weight gain was also observed in women who were on medications. The findings were well- supported by study conducted in Canada[21] that weight gain is obvious among individuals, thus accompanied reduced metabolic rate, increased consumption of calories and dwindled physical doings.

## CONCLUSION

Overweight and obesity is an important public health problem. The study on socio-demographic factors of overweight and obese women revealed that the prevalence of being overweight and obese increases with age and most vulnerable age group observed was 52-60 years. Diseases such as hypothyroidism, polycyclic ovarian syndrome, imbalance of menstrual period and depression/ stress were also the risk factors of overweight and obesity among 25 to 60 years women. Thus, the study concluded the relationship of socio-demographic factors as well as diseases with overweight and obesity.



## REFERENCES

1. Dee A, Callinan A, Doherty E, Oneill C, Mcveigh T, Sweeney MR, et al. **Overweight and obesity on the island of Ireland: an estimation of costs.** BMJ Open. 2015; 5(3).

2. Flegal KM, Carroll MD, Ogden CL, Johnson CL. **Prevalence and trends in obesity among US adults, 1999-2000.** Journal of American Medical Association. 2002; 288(14):1723-1727.

3. Zatońska K, Janik-Koncewicz K, Ilow R, Regulska-Ilow B, Różańska D, Szuba A et al. **Prevalence of obesity – baseline assessment in the prospective cohort 'PONS' study.** Annals of Agricultural and Environmental Medicine. 2011; 18(2): 246-250.

4. Gallus S, Odone, A, Lugo A, Bosetti C, Colombo P, Zuccaro P. et al. **Overweight and obesity prevalence and determinants in Italy: an update to 2010.** European Journal of Nutrition. 2012; 52(2): 677-685.

5. Doak CM, Wijnhoven TMA, Schokker DF, Visscher TLS, Seidell JC. **Age standardization in mapping adult overweight and obesity trends in the WHO European region.** Obesity Reviews. 2011; 13(2): 174-191.

6. Ghadiri-Anari A, Jafarizadah M, Zare A, Mozaffari-Khosravi H, Ardekani AS. **Prevalence of Obesity and Overweight among Adults in Iranian Population (Yazd Province).** Iranian Journal of Diabetes and Obesity. 2014; 5 (2): 67-70.

7. McLaren L. **Socioeconomic status and obesity.** Epi Rev. 2007; 29:29–48.

8. Ball K, Crawford D. **Socioeconomic status and weight change in adults: a review.** Social Science & Medicine. 2005; 60(9):1987–2010.

9. Khan A, Afridi AK, SadarM. **Prevalence ofobesity in employees of universities, health and research institutions of Peshawar.** Pakistan Journal of Nutrition. 2003; 2 (1):182-188.

10. Sobal J, Rauschenbach B, Frongillo EA. **Marital status changes and body weight changes: a US longitudinal analysis.** Social Science and Medicine. 2003; 56(7):1543–1555.

11. Harris KM, Lee H, DeLeone FY. **Marriage and health in the transition to adulthood: evidence for African Americans in the add health study.** Journal of Family Issues. 2010; 31(8): 1106–1143.

12. Teachman J. **Body Weight, Marital Status, and Changes in Marital Status.** Journal of Family Issues. 2016; 37(1): 74–96.

13. Mata J, Frank R, Hertwig R. **Higher body mass index, less exercise, but healthier eating in married adults: Nine representative surveys across Europe.** Social

Science & Medicine. 2015; 138:119-127.

14. Jeffrey R, Rick A. **Cross-sectional and longitudinal associations between body mass index and marriage-related factors.** Obesity Research. 2002; 10:809–815.

15. Gunderson EP. Childbearing **and Obesity in Women: Weight Before, During, and After Pregnancy.** Obstetrics and Gynecology Clinics of North America. 2009; 36(2):317–32.

16. Gao Y, Ran X-W, Xie X-H, Lu H-L, Chen T, Ren Y, et al. **Prevalence of overweight and obesity among Chinese Yi nationality: a cross-sectional study.** BMC Public Health. 2011; 11(1).

17. Nouhjah S, Nadi-baghu M, Salehi M, GhajarH. **Prevalence of Overweight, Obesity and the Related Factors in Women Aged 35-57 Years in Khuzestan Province of Iran.** Advanced Studies in Biology. 2012; 4 (2):57-65.

18. Cramer DW, Sluss P M, Powars RD. **Serum prolactin and TSH in an in vitro fertilization population: is there a link between fertilization and thyroid function?** Journal of Assisted Reproduction and Genetics. 2003; 20(6): 210-5.

19. Rizvi M, Abbas A, Tanwir S, Sabah A, Ali ZM, Murad MS, et al. **Perception and attitude of patients regarding polycystic ovarian syndrome (PCOS) in tertiary care hospitals of Pakistan - a survey based study.** International Journal of Pharmacy & Therapeutics. 2014; 5 (3), 147-152.

20. Begum P, Richardson CE, Carmichael AR. **Obesity in post-menopausal women with a family history of breast cancer: prevalence and risk awareness.** International Seminars in Surgical Oncology. 2009; 6(1):1.

21. Grundy A, Cotterchio M, Kirsh VA, Kreiger N. **Associations between Anxiety, Depression, Antidepressant Medication, Obesity and Weight Gain among Canadian Women.** PLoS ONE. 2014; 9(6):1-9.

22. Abrha S, Shiferaw S, Ahmed KY. **Overweight and obesity and its socio-demographic correlates among urban Ethiopian women: evidence from the 2011 EDHS.** BMC Public Health. 2016; 16(1).

23. Kishawi RRE, Soo KL, Abed YA, Muda WAMW. **Obesity and overweight: prevalence and associated socio demographic factors among mothers in three different areas in the Gaza Strip-Palestine: a cross-sectional study.** BMC Obesity. 2014; 1(1).

24. Abdeen Z, Jildeh C, Dkeideek S, Qasrawi R, Ghannam I, Al Sabbah H. **Overweight and obesity among Palestinian adults: analyses of the anthropometric data from the first national health and nutrition survey (1999–2000).** J Obes. 2012.

25. Esteghamati A, Meysamie A, Khalilzadeh O, Rashidi A, Haghazali M, Asgari F, et al. **Third national surveillance of risk factors of Non-communicable diseases (SuRFNCD-2007) in Iran: methods and results on prevalence of diabetes, hypertension, obesity, central obesity, and dyslipidemia.** BMC Public Health. 2009; 9(1):167.

26. El Rhazi K, Nejjari C, Zidouh A, Bakkali R, Berraho M, Barberger GP. **Prevalence of obesity and associated socio-demographic and lifestyle factors in Morocco.** Public Health Nutr. 2010; 14(1):160–7.

27. Aslam M, Saeed A, Pasha GR, AltafS. **Gender Differences of Body Mass Index in Adults of Pakistan: A Case Study of Multan City.** Pakistan Journal of Nutrition. 2010; 9 (2):162-166.

28. Neuman M, Finlay JE, Davey Smith G, Subramanian SV. **The poor stay thinner: stable socioeconomic gradients in BMI among women in lower- and middle-income countries.** Am J ClinNutr. 2011; 94(5):1348–57.

29. Zhang H, Xu H, Song F, Xu W, Pallard-Borg S, Qi X. **Relation of socioeconomic status to overweight and obesity: a large population-based study of Chinese adults.** Annals of Human Biology. 2017 May 23:1–7.

30. Sanyal D, Raychaudhuri M. **Hypothyroidism and obesity: An intriguing link. Indian Journal of Endocrinology and Metabolism.** 2016; 20(4):554.

31. Michalaki MA, Vagenakis AG, Leonardou AS, Argentou MN, Habeos IG, Makri MG, et al. **Thyroid Function in Humans with Morbid Obesity.** Thyroid. 2006; 16(1):73–8.

32. Carmina E. **Difference in body weight between American and Italian women with polycystic ovary syndrome: influence of the diet.** Human Reproduction. 2003Jan; 18(11):2289–93.

33. Yildirim B. **Relation of intra-abdominal fat distribution to metabolic disorders in nonobese patients with polycystic ovary syndrome.** Fertility and Sterility. 2003; 79(6):1358–64.

34. Strowitzki T, Capp E, Corleta HVE. **The degree of cycle irregularity correlates with the grade of endocrine and metabolic disorders in PCOS patients.** European Journal of Obstetrics & Gynecology and Reproductive Biology. 2010; 149(2):178–81.

35. Cupisti S, Kajaia N, Dittrich R, Duezenli H, Beckmann MW, Mueller A. **Body mass index and ovarian function are associated with endocrine and metabolic**

**abnormalities in women with hyper androgenic syndrome.** European Journal of Endocrinology. 2008Jan; 158(5):711–9.

36. Elting MW, Korsen TJ, Rekers-Mombarg LT, Schoemaker J. **Women with polycystic ovary syndrome gain regular menstrual cycles when ageing.** Human Reproduction. 2000; 15(1):24–8.

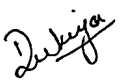
37. Ohayon MM. **Epidemiology of depression and its treatment in the general population.** Journal of Psychiatric Research. 2007; 41(3-4):207–13.

38. Onyike CU. **Is Obesity Associated with Major Depression? Results from the Third National Health and Nutrition Examination Survey.** American Journal of Epidemiology. 2003; 158(12):1139–47.

*Losers quit when they're tried.*
*Winners quit when they've won.*

**– Unknown –**

## AUTHORSHIP AND CONTRIBUTION DECLARATION

| Sr. # | Author-s Full Name | Contribution to the paper | Author=s Signature |
|---|---|---|---|
| 1 | Rukiya Tariq | Proposed Topic,Literature Review, Methodology, Data Collection, Statistical Analysis, Interpretation of results and Manuscript Writing. |  |
| 2 | Maryam Shahid | Literature Review, Interpretation of results and Manuscript Writing. |  |
| 3 | Kalsoom Tariq | Literature Review, Data collection and Manuscript writing. |  |