Association between Weight Status and Multimorbidity in Women at Reproductive Age Group Attending PHCCs in Baghdad 2019

Athraa Mothana Yassin[*], *Mohammed Asaad Al-Bayati* [**]

ABSTRACT:

BACKGROUND:

Multimorbidity defined as (simultaneous occurrence of two or more chronic health conditions in the same person without defining a primary disease) is a growing concern worldwide, with approximately 1 in 4 adults affected, associated with costly prolonged care and increased mortality and morbidity. These negative consequences affect individuals, households, and the whole society.

OBJECTIVE:

To describe the association between multimorbidity and weight status in women of reproductive age attending PHCCs in Baghdad.

METHODS:

Cross-sectional study was carried out among a random sample of women aged 15–49-year-old who attended 8 PHCCs in Baghdad from the March 1st to July 30th, 2019, the data was collected via a direct interview with women using a specially prepared questionnaire to obtain information on basic characteristics, history of the chronic health problems then weight and height were measured for estimation of BMI.

RESULTS:

Out of 415 women, more than one third were obese and another 34% were overweight, approximately 15% of them had one chronic condition and 21% had multimorbidity in addition, overweight and obese women had 2.5 times and 4.369 times, respectively, more risk for developing multimorbidity. Hypertension is the most prevalent chronic health condition in this study group.

CONCLUSION:

More than two thirds of women in the reproductive age group had overweight and obesity, Multimorbidity was common among women included in the study especially obese and overweight, this may be relevant to improve the primary prevention and management programs of obesity and multiple chronic conditions in women at PHCCs level.

KEYWORD: multimorbidity, women, Baghdad

INTRODUCTION:

Chronic or non-communicable diseases (NCD) are increasingly becoming a major health burden morbidity and mortality particularly in the low and middle-income countries (LMICs). Multimorbidity is defined as the presence of two or more chronic diseases at the same time without any particular dominant condition within an individual, it is an emerging issue in public health agenda in LMICs due to its increasing prevalence, impact on individual health status, and the financial impact on the health care system[(1)].

Overweight is defined as a body mass index (BMI) of higher than 25 kg/m^2, while obesity is defined as BMI ≥30 kg/m^2, it is associated with increased morbidity and mortality from a number of many long-term diseases including type II diabetes, coronary heart disease, musculoskeletal problems, and cancer[(2)].

The WHO Global status report on non-communicable diseases (NCDs) 2010 showed that NCDs were globally the biggest cause of death. Of the 57 million deaths that occurred worldwide in 2008, about two thirds 36 million (63 %) were due to non-communicable diseases, principally cardiovascular diseases like heart attacks and stroke (48 %), cancer (21 %), chronic respiratory diseases such as chronic obstructive pulmonary disease and asthma (12 %) and diabetes (4%). Unfortunately, more than 9 millions of these deaths occurred before the age of 60 and could have largely been prevented, furthermore, 80 % of theses NCDs resides in LMICs and more than 40 % of NCD-related deaths happened among people younger than 60 years old, approximately three times

*Family physician/ Ministry of Health/ Baghdad / Iraq
**Family and Community Medicine Department/ Al-Kindy College of Medicine/ Baghdad University/ Baghdad, Iraq

the proportion in high-income countries (13%)[3].
In Iraq, the prevalence of obesity and overweight are high, especially among women. According to the results of the STEP survey that was carried out in 2015 among Iraqi adults, obesity constituted one third (33.5 %) of the population, while nearly another third was overweight (31.9)[4].
The most common definition of multimorbidity is "more than one or multiple chronic or long-term diseases/conditions" (including physical or mental diseases or both), which was closely followed by "more than one disease or condition" without specifying chronic or long-term duration although used. The former is consistent with the WHO definition of multimorbidity, which defines multimorbidity as "more than one or multiple chronic or long-term diseases/ conditions" (including physical or mental diseases or both)."[5].
The patients with multimorbidity are at a higher risk of death, worsened functional status due to disturbing physical and mental health, and poorer quality of life. At the health care level, it implies postoperative complications, longer hospital stays, higher likelihood of readmission, more frequent health care utilization and higher direct costs[6].

OBJECTIVES:

1. To evaluate the association between weight status and multimorbidity seen in women of reproductive age.
2. To evaluate the impact of the basic characteristics of women in the reproductive age group on weight status and multimorbidity.

SUBJECTS AND METHOD:

Study design and setting: Cross-sectional study was conducted in 8 primary health care centers (PHCCs) in Baghdad selected by convenient sampling technique [4 in Al-Karkh health directorate (Al-Jihad, Al-Adil, Al-Ameryia, and Al-Shohadaa PHCC) and 4 in Al-Resafa health directorate (Al-Dubat, New Baghdad Al-Aol, AL-Mustansiriyah, Al-Adhymia Al-Aol PHCC)], during the period from first of March till the end of June 2019.

Study group:
Random sample of Iraqi women in the reproductive age group who agreed to join in the study considered eligible.

Inclusion criteria: All women of reproductive age between 15–49 years.

Exclusion criteria: Pregnant and lactating women were excluded.

Sample size:
The sample size was calculated using the single population proportion[7]:

$$n = \frac{Z^2\, P(1-P)}{d^2}$$

Study Tool: Data were collected using a self-administrated questionnaire which was formulated for the study after reviewing related published research and validated by 5 panel experts in Alkindy College of Medicine/Department of Family Medicine and Community.
The Questionnaire included three parts:

- First part was composed of sociodemographic questions (age, marital status, number of children, and family arrangement), socioeconomic state (SES) assessment (educational level, occupation, house ownership, and car ownership), and questions that covered the behavioral history of participants which include smoking status, physical activity, and healthy diet.
- Second part was composed of questions about the number, type, and duration of chronic health conditions
- Third part was composed of the measurement of height and weight of

Definition of Study variables
Healthy diet assessed by asking about eating fruit and/or vegetables at least 5 times/day.
Sedentary Behavior was assessed by asking about spending more than 14 hours per week (2 hours per day) watching television, videos, and/or using computers during leisure time. (Using computers includes playing computer games and using the Internet)[8].
Weight (wt) status: Assessed by measuring BMI and classified according to WHO classification of BMI for adults
18.5–24.9: Normal weight
25.0–29.9: Overweight (Pre-obesity)
30.0 and above : Obesity(9).
For this study, the following 11 chronic conditions were analyzed including (ischemic heart disease, heart failure, hypertension, diabetes (excluding diabetes associated with pregnancy), cerebrovascular disease, joint pain and osteoarthritis, asthma, chronic lung disease (includes emphysema, bronchitis, chronic obstructive pulmonary disease), chronic renal failure, all neoplasms, and depression.
Pilot study. A preliminary pilot study was carried out at Al-Ameryia PHCC from the first to the 20th of March 2019; Questionnaire was pre-tested on 20 women respondents who were not included in the final study group,

to determine whether it was adequately clear and comprehensive enough to address the objectives of the study. Also, to find out the time needed for filling the questionnaire and to address the difficulties that may be faced during the main data collection.

Ethical approvals. Official permissions to carry out the study were obtained from the Iraqi Board for Medical Specializations. In addition, the official agreement and permission were obtained from Baghdad Health Directories (both Al-Karkh and Al-Resafa)**.** Verbal consent was obtained from each study participant

Data Analysis: Microsoft Excel was used for data entry and Data was analyzed using Statistical Packages for Social Sciences (SPSS), version 25. Data was presented in form of frequencies and percentages in tables as well as in figures. Chi-square test, odds ratio, 95% confidence interval were used to evaluate the association between the study variables. A p-value of less than or equal to 0.05 was considered statistically significant. Binary logistic regression models were then fitted to test the associations between multimorbidity and weight status after adjustment of independent variables.

RESULTS:

This study included 415 women in the reproductive age group (7 participants excluded because not meet the criteria of age) with a mean of age 36.7 -+ 8.8, more than 75 % of them married, 61 (14.7%) had more than five children, 172 (41.4%) live in the extended family, 146 (35.2%) had poor SES, 24 (5.8%) smoker, 263 (63.4%) of them had a sedentary lifestyle, 248 (59.8%) of them eating a healthy diet (Table 1).

Table 1: Distribution of studied sample according to basic characteristics.

		Count	N %
Age	≤25 year	54	13.0
	26 - 35 year	134	32.3
	≥35 year	227	54.7
Social status	Single	44	10.6
	Married	313	75.4
	Divorced/widowed	58	14.0
Children	No children	71	17.1
	1-5 child	283	68.2
	> 5 children	61	14.7
Family arrangement	Couple	170	41.0
	Extended	172	41.4
	Alone	27	6.5
	Other	46	11.1
Socio-economic state	Poor	146	35.2
	Fair	142	34.2
	Good	127	30.6
Smoking	Yes	24	5.8
	No	391	94.2
Sedentary behavior	Yes	263	63.4
	No	152	36.6
Healthy diet	Yes	248	59.8
	No	167	40.2

Regarding wt. state, 121 (29%) of women enrolled in this study had a normal wt. (BMI=18-24.5), 141 (34 %) of them were classified as overweight (BMI=25-29.5) and 153 (37%) of them were classified as obese women (BMI>30), as shown in figure 1.

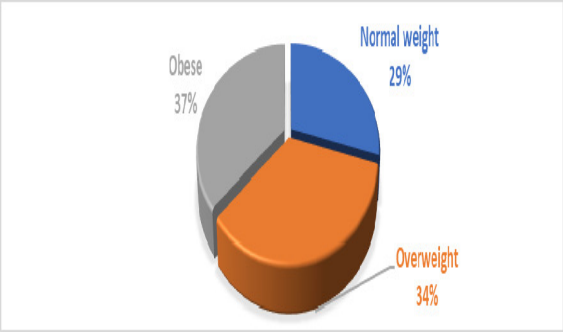

Figure 1: Distribution of study group according to wt. status.

Individual morbidity showed in table 3 where Hypertension is the most common chronic health condition found in studied participants with a prevalence of (22.9%) followed by joint pain and osteoarthritis (20.2%) and diabetes (10.6%) respectively (Table 2).

Table 2: Distribution of studied cases according to the prevalence of chronic diseases.

chronic diseases	No	%
Hypertension	95	22.9
Joint pain and osteoarthritis	84	20.2
Diabetes mellitus	44	10.6
Ischemic heart disease	18	4.3
Asthma	17	4.1
Heart failure	14	3.4
Chronic lung disease	10	2.4
Depression	7	1.7
Cerebrovascular accident	4	1.0
Chronic kidney disease	2	0.5
Neoplasm	1	0.2

The result revealed a statistically significant association between age, marital status, number of children, family arrangement, and SES and wt. status, as shown in table 3.

Table 3: Association between studied independent variables and weight status.

		Normal		overweight		obese		P-value
		No	%	No	%	No	%	
Age	=<25 year	34	63.0	13	24.1	7	13.0	0.001
	26-35 year	47	35.1	55	41.0	32	23.9	
	>35 year	40	17.6	73	32.2	114	50.2	
Marital status	Single	25	56.8	11	25.0	8	18.2	0.001
	Married	84	26.8	112	35.8	117	37.4	
	Divorced / widowed	12	20.7	18	31.0	28	48.3	
Children	No children	32	45.1	25	35.2	14	19.7	0.001
	1-5 child	81	28.6	96	33.9	106	37.5	
	> 5 children	8	13.1	20	32.8	33	54.1	
Family arrangement	Couple	41	24.1	68	40.0	61	35.9	0.015
	Extended	51	29.7	51	29.7	70	40.7	
	Alone	7	25.9	7	25.9	13	48.1	
	Other	22	47.8	15	32.6	9	19.6	
SES	Poor	32	21.9	43	29.5	71	48.6	0.003
	Fair	43	30.3	50	35.2	49	34.5	
	Good	46	36.2	48	37.8	33	26.0	
Smoking	Yes	10	40.0	6	24.0	9	36.0	0.395
	No	111	28.5	135	34.6	144	36.9	

sedentary behavior	Yes	78	29.7	90	34.2	95	36.1	0.913
	No	43	28.3	51	33.6	58	38.2	
healthy diet	Yes	76	30.6	80	32.3	92	37.1	0.603
	No	45	26.9	61	36.5	61	36.5	

The majority of the participants (64.3%) had no chronic diseases, 14.9% had one chronic disease, while 21% of them experienced multimorbidity (Table 4).

Table 4: Distribution of studied cases according to number of chronic diseases.

Diseases	N	%
No chronic disease	267	64.3
One disease	62	14.9
Two diseases	46	11.1
Three diseases	24	5.8
Four diseases	10	2.4
Five and more diseases	6	1.4

The result shown in table (5) revealed a statistically significant association between wt. status and multimorbidity (P=0.001) as the rate of multimorbidity tend to increase with the increased BMI (Table 5).

Table 5: Association between weight and multimorbidity.

Weight	Multimorbidity			
	No		Yes	
	No.	%	No.	%
Normal	114	94.2	7	5.8
Overweight	118	83.7	23	16.3
Obese	97	63.4	56	36.6

X^2 =41.5, d.f.=2, P=0.0000

The result shown in table (6) revealed a statistically significant association between multimorbidity and age, marital status, number of children, SES, family arrangement, and smoking, while sedentary behavior and eating a healthy diet had no statistically significant association with multimorbidity (Table 6).

Table 6: Association between studied independent variables and multimorbidity.

Characteristics		Multimorbidity				P-value
		No		Yes		
		No.	%	No.	%	
Age	=<25 year	54	100.0	0	0.0	0.001
	26-35 year	129	96.3	5	3.7	
	>35 year	146	64.3	81	35.7	
Social Status	Single	40	90.9	4	9.1	0.005
	Married	251	80.2	62	19.8	
	Divorced / widowed	38	65.5	20	34.5	
Family arrangement	Couple	135	79.4	35	20.6	0.034
	Extended	133	77.3	39	22.7	
	Alone	18	66.7	9	33.3	
	Other	43	93.5	3	6.5	
Children	No children	64	90.1	7	9.9	0.001
	1-5 child	233	82.3	50	17.7	
	> 5 child	32	52.5	29	47.5	
Smoking	Yes	15	62.5	9	37.5	0.037
	No	314	80.3	77	19.7	
Sedentary behavior	Yes	213	81.0	50	19.0	0.258
	No	116	76.3	36	23.7	
SES	Poor	102	69.9	44	30.1	0.001
	Fair	115	81.0	27	19.0	
	Good	112	88.2	15	11.8	
Healthy diet	Yes	196	79.0	52	21.0	0.881
	No	133	79.6	34	20.4	

DISCUSSION:

In the current study, from total women patients attending the selected PHCCs, 34% were overweight and 37% were obese, and obesity was linked to older age, being divorced/ widowed, having > 5 children, living in extended family arrangements, and having poor SES. These figures were in comparison to the results of Al-Saleem et al (2013) in Saudi Arabia that reported that 29% of women were overweight and 44% were obese, and obesity was associated with age group 45-64 years[9]. In Erbil/Iraq, a study was done by Sherzad (2019) had revealed that the prevalence of obesity/overweight was 79%, and they were associated with older age, ever married, and unemployment, while they showed a significant association of overweight/obesity with nonsmokers, sedentary lifestyle [10]. Women in Iraq may suffer sedentary inside-home lifestyle due to cultural/ religious limitations for practicing exercise.

Hypertension was the most common chronic disease, followed by osteoarthritis and other joint diseases, diabetes, then other diseases. These figures were comparable to the report of Boutayeb et al (2013) who reported that in Iraq the cardiovascular was the most common cause for death with 25%, and respiratory diseases with 2%, and diabetes with 1% [11]. The most common chronic diseases in females were cardiovascular diseases (15.12%), hypertension (15.04%), and respiratory diseases (14.43%) as reported by a study was done in Saudi Arabia[12]. In another study done by Leal Neto et al (2016) in Brazil, the most common disease was hypertension, then cardiovascular, joint disease, and a lower rate of chronic respiratory diseases [13]. This could be attributed to different genetic, ethnic, and environmental factors that might increase the prevalence of one disease over the other, also the distribution of age groups differs between societies due to different life expectancies between nations, but even in developing countries like ours, the life expectancy is increasing along with the prevalence of chronic illnesses[14]. Obesity is related to multimorbidity as it results in physiological alteration and dysfunctions in the body which have to increase the risk of hypertension and insulin resistance [15].

The prevalence of multimorbidity in the current study was 21%, and those with two diseases formed 11.1%, three diseases 5.8%, four 2.4%, and five and more 1.4%. In another study done by Guisado-Clavero et al (2018), the prevalence of the number of diseases was 5.1%, for two diseases and 27.43% for 3-5 diseases[16].

In Iraq, a study was conducted in Basrah Governorate revealed that overweight and obesity were more prevalent among women aged more than 50 years with a total prevalence of obesity among women of 54.7%[17], while in Baghdad the prevalence of obesity was 35.2% and the determinants were age, education, and divorced or widows[12]. With aging the possibility of increasing the number of diseases increases, and this could explain the difference between the results of this study with a younger population.

Multimorbidity was associated with increasing BMI. Another study was done by Alimohammadian et al (2017) in Iran and revealed that women had higher rates of multimorbidity with increasing BMI [18]. These findings are aligned with the hypothesis that both overweight and obesity are important risk factors for chronic diseases, which can lead to multimorbidity [19, 20].

In the current study, factors that increased the prevalence of multimorbidity were age, divorced/ widowed, higher number of children, poor socio-economic state (SES), living alone, and smoking. This was comparable to the results of Alimohammadian et al (2017) as they reported that women had higher rates of maternal mortality with increased with age, increasing BMI, marriage, lower educational levels, unemployment, poor SES, not performing physical activities, ex-smokers, and heavy smokers, also they reported that in overweight/ obese women there was a 1.43 and 1.87 times, respectively, increased risk for developing maternal mortality[18]. This discrepancy in findings may be due to the age of study participants; significant relationships between exercise and multimorbidity have been found for older adults, but not younger individuals [21, 22].

This study's findings indicated that low and middle SES had an association with multimorbidity in women, which has supported the assertion that women are at higher risk from the adverse effects of poverty, payment inequality, and health disparities [23]. Khanam et al concluded that gender differences in SES, living and working environments, lifestyle factors, and life events might affect the occurrence and outcome of multimorbidity among women [24].

Regarding diet, there is an evidence from a study done by Dekker et al (2019), who reported that there were significant associations between

dietary patterns and multimorbidity, in particular, a "meat, alcohol and potato pattern" [25]. Although our results showed no significant associations between the healthy diet and multimorbidity, this could be attributed to the nature of the question used to assess "healthy diet depending only upon vegetables and fruits consumption, which does not investigate other items and possible diet patterns.

CONCLUSION:

More than two thirds of women in the reproductive age group included in this study had overweight or obesity. There was a significant association between weight and the presence of chronic diseases, multimorbidity was more common among obese women compared to those with normal or overweight.

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