The effect of marital status and depression on Fasting Blood glucose in Al-Najaf governorate

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1- BACKGROUND

FBS, or fasting blood sugar, analyzes blood sugar levels following an overnight fast (without eating). Fasting blood sugar levels of 99 mg/dL or less are considered normal, 100 to 125 mg/dL suggest prediabetes, and 126 mg/dL or more suggest diabetes [1]. Low fasting blood glucose levels, or hypoglycemia, are below 70 mg/dL (3.9 mmol/L), Hyperglycemia, or an increase in fasting blood glucose, is a sign that someone is at higher risk of developing diabetes. It also called fasting blood plasma glucose (FPG). Mean FPG is utilized as a proxy for both the promotion of healthy diets and behaviors and the management of diabetes at the national level [2]. High fasting blood sugar was one of the major contributing factors. More than 41 million deaths annually, or 71% of all fatalities worldwide [3] . Diet is a significant modifiable risk factor, and dietary changes have the potential to significantly lower disease incidence and mortality [4]. Diseases are caused by a combination of genetic, environmental, and behavioral risk factors. A study found no correlation between marital status and pre-diabetes or FBS [5]. Married men were less likely to have several risk factors, including hypertension, high FBS, and high HbA1c [6]. An further study found no connection between depressive symptoms and higher fasting blood glucose [7].

2: MATERIALS AND METHODS

The Subjects in present study were included eighty five (85) Subjects were contained forty three (43) normal married men and forty two (42) normal unmarried men were obtained from different places in Al-Najaf province/ Iraq. Smokers and people with heart disease, diabetes, arthritis and bone disease are excluded. The current study included age, Goldbergs depression scale and BMI . Goldberg Depression Test is an 18-question screening tool for depression. It was done for most subjects [8].GH-900Plus HbA1c Analyzer was used to measuring F.B.S. this analyzer work in HPLC Technology the gold standard methodology of HbA1c detection. All data were analyzed by the SPSS software (V.28 Inc., Chicago, USA. Kolmogorov-Smirnov test for variables distribution. Normally distributed Numerical Variables were compared between two groups by independent t-test, and ANOVA for compared among three or more groups. All data expressed as (mean ± SD) standard deviation.

3- RESULTS

3. 1. Average F.B.S between the unmarried and unmarried males

The results in figure (3-1) showed that no significant difference (p value= 0.393) in the average F.B.S when compare between the unmarried males (138.60±32.16) and unmarried males (146.09±46.87).

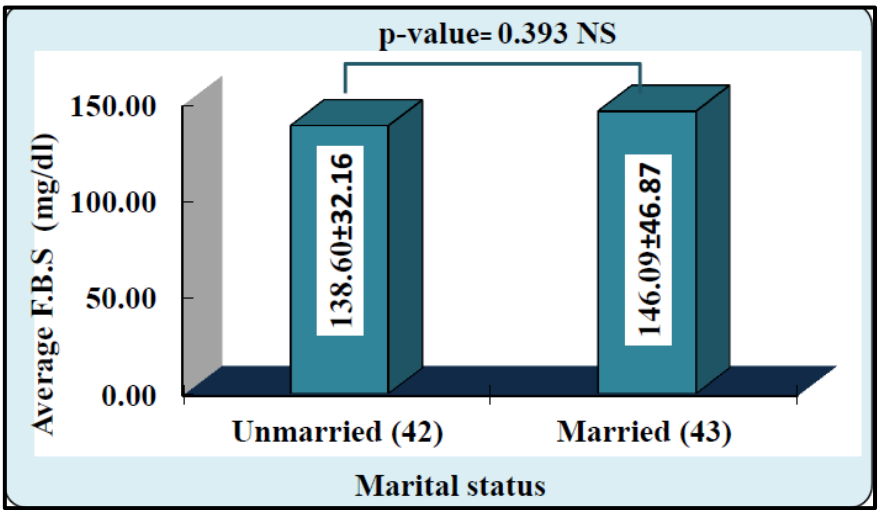

Figure (3-1): Comparison of average F.B.S between married and unmarried males. Values are expressed as mean ±SD. FBS: Fasting Blood Sugar.

3.2. Comparison of Average FBS levels between depressed and non-depressed males The results in figure (3-2) showed that there was significant difference (p-value= 0.048) in the average F.B.S when compare between the depressed males (155.89±40.95 mg/dl) and non- depressed males (138.5±39.46 mg/dl).

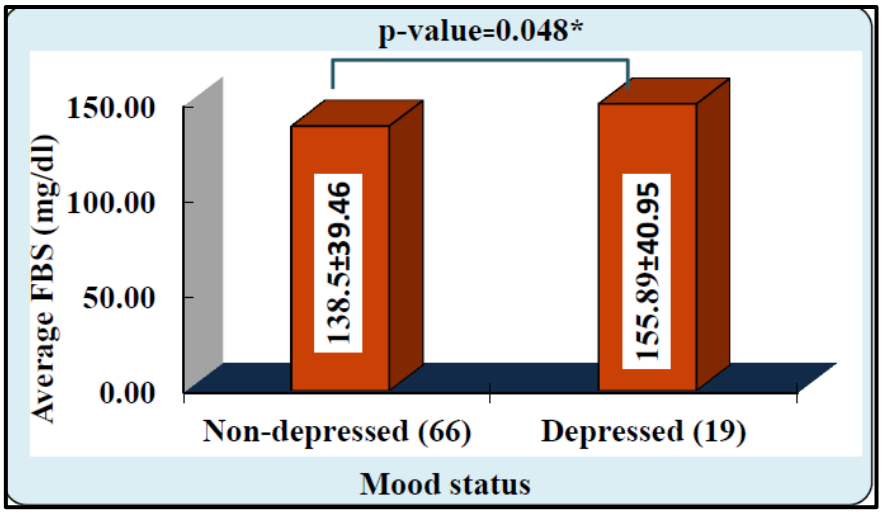

Figure (3-2): Comparison of Average FBS levels between depressed and non-depressed males. Values are expressed as mean ±SD. *Significant differences at p-value <0.05. FBS: Fasting Blood Sugar.

3.3. The effects of marital status on FBS in depressed and non-depressed males

The results of average F.B.S indicated that there was a significant increase (158.07±43.19 mg/dl) in depressed unmarried males compared with non- depressed unmarried males (127.78±16.93), (p-value= 0.002*). Also, the results indicated that a non- significant difference between depressed married males (147.75±35.26 mg/dl) and non- depressed married males (145.92±48.26 mg/dl), (p-value=0.942).

Table (3-1): Comparison the effects of the marital status on biochemical parameters in depressed and non-depressed males

	Marital status / Mood Status	Unmarried (means±SD)	p-value	Married (means±SD)	p-value
Average F.B.S (mg/dl)	**Non-depression**	127.78±16.93	0.002*	145.92±48.26	0.942
	Depression	158.07±43.19		147.75±35.26	

3.4. Comparison of FBS according to BMI classifications

The results of the effects of BMI on the study parameters are presented in table (3-2), the results indicated that there was insignificant increase (p- value=0.676) in Average F.B.S in overweight (143.84±46.27mg/dl) and obesity (149.43±43.97mg/dl) group compared with underweight (132.30±29.14 mg/dl) and normal weight (138.14±31.36 mg/dl) respectively.

Table (3-2): Comparison the effects of the BMI on FBS

Study parameter	Underweight n=10	Normal weight n=22	Overweight n=32	Obesity n=21	p-value
Average F.B.S (mg/dl)	132.30±29.14	138.14±31.36	143.84±46.27	149.43±43.97	0.676

3.5. Studying the effect of the interaction between marital status and BMI on FBS

The results of the interaction between marital status and BMI on FBS were presented in table (3-3), the results showed that the increase in body mass is associated with a non-significant differences in the level of average F.B.S in both married and unmarried males.

Table (3-3): Comparison the effects of the interaction between marital status and BMI on FBS

Variables	BMI Classification	Unmarried	Married	Multivariate p-value
Average F.B.S (mg/dl)	Underweight	143.00±33.12	116.25±12.12	0.596
	Normal weight	139.00±36.28	136.63±22.37	
	Overweight	126.91±14.82	152.71±54.48	
	Obesity	147.91±38.54	151.10±51.38	

3.6.1. Correlation between FBS with Age in unmarried males

The results of the interaction between age and FBS were presented in table (3-4), the results showed that is no associated the level of average FBS with age in unmarried males

Table (3-4): Correlation between FBS with Age in unmarried males

		Age (years)
Average F.B.S (mg/dl)	**R**	0.039
	p-value	0.806

3.6.2. Correlation between FBS with Age in married males

Results of study in table (3-5) showed a significant positive correlation ($r= 0.399^{**}$, p=0.008) between FBS and age.

Table (3-5): Correlation between FBS with Age in married males

		Age (year)
Average F.B.S (mg/dl)	**r**	0.399**
	p-value	0.008
**. Correlation is significant at the 0.01 level (2-tailed).		

4- DISCUSSION

The results in figure (3-1) showed that no significant difference (p value= 0.393) in the average FBS when compare between the unmarried males (138.60±32.16) and unmarried males (146.09±46.87). The result indicate that marriage is not a significant predictor of high blood sugar levels. Rather, it appears that dietary habits play a larger role in blood sugar regulation regardless of marital status. These findings have been supported by numerous previous studies. Fukuda and Hiyoshi (2013) found that married men had lower odds of having a number of risk factors, including hypertension, high FBS, and high HbA1c [6]. Despite the fact that Yohannes et al. discovered a connection between marital status and the development of blood glucose levels[9]. Divorced or separated men are more likely to get diabetes[9]. Without the social support and control that marriage can offer in terms of eating responsibly, men may be more likely to engage in unhealthy eating habits that lead to obesity [10]. Married men may benefit from the social control and support of their spouses in this regard. Where However, there was no main effect of spousal support found in the analysis of fasting blood glucose variability[11]. The results in figure (3-2) showed that there was significant difference (p-value= 0.048) in the average FBS when compare between the depressed males (155.89±40.95 mg/dl) and non- depressed males (138.5±39.46 mg/dl). This finding is substantiated by numerous studies that have established a significant association between depression and fasting blood sugar (FBS) levels . There is a statistically significant link between FBG and depression [7]. According to a different study, diabetic patients had considerable levels of specific sadness and anxiety markers [12]. Female gender, older years, high BMI, and high FBS were revealed to be factors that were independently linked with depression [13] .FBS was linked to depression and anxiety [14] . According to case-control research, having diabetes mellitus, being depressed, and being older were all linked to a higher risk of acquiring elevated FBS [15] .

The results of the effects of FBS according to the depression scale were presented in table (3-1), the results of average FBS indicated that there was a significant increase (158.07±43.19 mg/dl) in depressed unmarried males compared with non- depressed unmarried males (127.78±16.93), (p-value= 0.002*). Also, the results indicated that a non- significant difference between depressed married males (147.75±35.26 mg/dl) and non- depressed married males (145.92±48.26 mg/dl), (p-value=0.942). Our study provides empirical support for the idea that marriage might serve as a protective factor, reducing the potential negative effects of depression on functional brain connectivity. A more in-depth research revealed that marital status reduced the effects of these traits on follow-up fasting glucose, such that hostility and anger were only significant in those who were single [16]. As confirmed by many studies, depression is linked to being single and also leads to an increase in FBS, so this led to the emergence of a difference between the two groups of unmarried man, and it did not appear between the two groups of married people, because marriage reduces these effects. The likelihood of depression will rise by 1.20% for every unit higher fasting blood sugar levels [17] . Male gender, living in an urban area, and being single were all linked to higher risks of depression [18]. According to a study, patients with depression had FBS means that were greater than those who were classified as not having depression [19].

The results of the effects of BMI on FBS are presented in table (3-2), the results indicated that there was insignificant increase (p- value=0.676, p-value=0.726) in Average FBS in overweight (143.84±46.27mg/dl) and obesity (149.43±43.97mg/dl) group compared with underweight (132.30±29.14 mg/dl) and normal weight (138.14±31.36 mg/dl) respectively. According to scientific research, there is a relationship between continuous high blood sugar levels and weight gain, as

excess glucose can be converted into fat and stored in the body, potentially leading to an increase in body mass index (BMI). Many studies support our results. According to Nasr et al. TG and FBS were directly correlated with BMI and male sex [20]. Obese people of both sexes have considerably higher fasting serum glucose levels [21].

The results of the interaction between marital status and BMI on FBS were presented in table (3-3), the results showed that the increase in body mass is associated with a non-significant differences in the level of average FBS in both married and unmarried males. The results do not show any differences between married and single people, and this for our society, according to my opinion, is a positive indicator, because many of our society believe that married people eat more and are more prone to obesity and diabetes, but our study and other studies have proven that there is no difference between married and single people in terms of obesity.

The correlation between FBS and age in table (3-4) and (3-5) showed no association in unmarried male , while there is a positive correlation in the married male.

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