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ORIGINAL ARTICLE

Relationship Between Body Composition Indicators and Probability of Sexual Dysfunction in a Cohort of Egyptian Males

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Abstract

Background: **Human body composition indices are of special interest to health care professionals. The evaluation of body composition offers valuable information regarding the nutritional status as well as the functional capability of the human organism.**

Aim and objectives: **Evaluation of body composition indicators including fat percentage, visceral fat, and body mass index (BMI) and their relation to sexual dysfunction and both penile length and its abnormalities among Egyptian adults.**

Patients and methods: **This prospective research was done on 500 randomly enrolled adult married males (18—30 y). This study was conducted at the Department of Dermatology, Venereology, and Andrology, Faculty of Medicine, Al-Azhar University.**

Results: **The risk and severity of erectile dysfunction were significantly increased with BMI greater than 30 kg/m^2 Also, the risk of erectile dysfunction was significantly elevated among groups with total body fat (TBF) greater than 20%, high visceral fat level (VFL), and very high VFL. The risk of premature ejaculation was also significantly elevated among subjects with BMI greater than 30 kg/m^2, with TBF greater than 20%, high and very high VFL.**

Conclusion: **Regarding our results we concluded that the risk and severity of erectile dysnfunction was significantly increased with obesity (BMI>30 kg/m^2), TBF greater than 20%, and visceral obesity (VFL>9). Also, the risk of premature ejaculation was also significantly increased obesity (BMI>30 kg/m^2), TBF greater than 20%, and visceral obesity (VFL>9). Moreover, there is no significant correlation between (BMI, TBF, and VFL) and penile length.**

Keywords: Body composition, Egyptian males, Sexual dysfunction

1. Introduction

Human body composition indices are of special interest to health care professionals. An individual's dietary health and physical prowess can be gleaned via a body composition analysis. There is a growing need for highly sensitive and accurate methods of analyzing body composition due to the epidemic of obesity and other lifestyle-related diseases.[1]

Decreased libido, erectile dysfunction, premature ejaculation, delayed or suppressed orgasm, and anatomical abnormalities of the penis are all examples of male sexual dysfunction, which is one of the most frequent health conditions in the world.[2]

BMIs of 25—29.9 kg/m^2 and 30 kg/m^2 indicate overweight and obesity, respectively. It is postulated that hormonal, metabolic, and psychological characteristics all contribute to the deleterious effect of excess weight on sexual function.[3]

Premature ejaculation is inversely related to a man's body fat percentage, which has been correlated with an increased risk of erectile dysfunction (ED).[4]

The length of a man's penile organ is becoming increasingly significant since it is linked to their perceived sexual prowess and virility. Penile size

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refers to the length and width of human male genitalia numerous research have explored penile length and its association with somatometric factors such as height, weight, and BMI.[5]

This research aims to the evaluation of body composition indicators including fat percentage, visceral fat and BMI and their relation to sexual dysfunction and both penile length and its abnormalities among Egyptian adults.

2. Patients and methods

This prospective research was done on 500 randomly enrolled adult married males (18–30 y) and conducted at the Department of Dermatology, Venereology, and Andrology, Faculty of Medicine, Al-Azhar University.

Inclusion criteria: Adult healthy married males between 18 and 30 years old. All males included are circumcised.

Exclusion criteria: Medical conditions such as Cushing's syndrome, hypothyroidism, endocrine illnesses, hypothyroidism and Cushing's syndrome in the past. Usage of antipsychotics, steroids, or other medicines known to cause or contribute to alterations in body fat; previous pharmaceutical usage for controlling lipid levels and history of penile pathology or congenital anomalies.

2.1. Methodology

All patients were subjected to the following:

Taking a thorough history includes questions about the patient's demographics (name, age, place of residence, smoking habits, alcohol consumption, and drug abuse) and sexual background (etiology, progression, duration, morning erections, erection frequency, erection quality, and whether or not erectile episodes happen in response to visual or manual stimulation or during extramarital relations). Interactional frequency history of medical conditions like diabetes, hypertension, and coronary artery disease; body composition indices (BMI, body fat percentage, and visceral fat level) determined via a BIA analyzer; existence of factors that may precipitate psychogenic erectile dysfunction, like anxiety, depression, or a history of any psychic disorders.

The International Index of Erectile Function-5 (IIEF-5) questionnaire was utilized to evaluate sexual performance. The Arabic index of premature ejaculation (AIPE) was utilized to quantify the severity of premature ejaculation. In a standing position and at room temperature, the flaccid (FPL) and fully stretched (SPL) penile lengths were determined.

Ethical consideration: following the permission of the Medical Research Ethics Committee, an informed agreement was obtained from each participant in the investigation prior to their participation in the research project.

2.2. Statistical analysis

The Statistical Program for the Social Sciences, Version 22.0 (Chicago, Illinois: SPSS Inc.), was utilized in order to do an analysis on the data that were gathered. A level of statistical significance was determined to be achieved when P values were less than 0.05. The collected data were tabulated and presented in frequency number and percent for categorical variables and mean and standard deviation for numerical variables. Correlation between IEEF and AIPE and the studied body fat composition (BMI, total body fat (TBF) and visceral fat level (VFL)) were done using Pearson's correlation coefficient. The effect of BMI, TBF and VFL on the risk of erectile dysfunction and premature ejaculation were examined by calculating the odds ratio and its 95% confidence interval while controlling for age. Finally, the effect of BMI, TBF and VFL on the penile length was examined using linear regression analysis.

3. Results

Our study presented the correlation between BMI, TBF and VFL and the risk of erectile dysfunction amongst the studied group. The risk of erectile dysfunction was significantly elevated among subjects with BMI greater than 30 kg/m^2 with an adjusted odds ratio (OR) of 2.50 (95% CI = 1.21–5.12). Also, the risk of erectile dysnfunction was significant increased among group with TBF greater than 20% (OR = 4.90; 95% CI = 1.70–13.8), high VFL (OR = 4.40; 95% CI = 1.60–11.8), and very high VFL (OR = 6.20; 95% CI = 2.30–16.5), (Table 1).

Our study displayed the effect of BMI, TBF and VFL on the risk of premature ejaculation among the studied group. The risk of premature ejaculation was significantly increased among group with BMI greater than 30 kg/m^2 with an odds ratio (OR) of 4.40 (95% CI = 2.38–8.10). The risk of premature ejaculation was strongly and significantly associated with TBF greater than 20% where the risk among this group was increased 23 times the risk among group with TBF from 8 to 20% (OR = 23.0; 95% CI = 5.60–95.6). The risk of premature ejaculation was also significantly increased among subjects with high VFL (OR = 6.0; 95% CI = 2.40–14.7), and very high VFL (OR = 15.0; 95% CI = 6.20–35.7), (Table 2).

Table 1. Effect of BMI, TBF and VFL on the risk of erectile dysfunction among the studied group.

	IIEF-5 < 22 *n* (%)	IIEF-5 ≥22 *n* (%)	Odds ratio (95% CI)[a]
BMI			
<18.5 kg/m^2	1 (2.8)	35 (97.2)	0.40 (0.10–2.93
18.5-<25 kg/m^2	11 (7.3)	139 (92.7)	1.00 (Reference)
25-<30	8 (7.5)	99 (92.5)	1.04 (0.40–2.70)
≥30	35 (16.9)	172 (83.1)	2.50 (1.21–5.12)[b]
TBF			
8–20%	4 (3.1)	126 (96.9)	1.00 (Reference)
>20%	51 (13.8)	319 (86.2)	4.90 (1.70–13.8)[b]
VFL			
Normal (1–9)	5 (3.2)	151 (96.8)	1.00 (Reference)
High (10–14)	22 (12.3)	157 (87.7)	4.40 (1.60–11.8)
Very high (15–30)	28 (17.0)	137 (83.0)	6.20 (2.30–16.5)

[a] Odds ratio adjusted by age of the studied group.
[b] Significant.

Table 2. Effect of BMI, TBF and VFL on the risk of premature ejaculation among the studied group.

	APIE <31 *n* (%)	APIE ≥31 *n* (%)	Odds ratio (95% CI)[a]
BMI			
<18.5 kg/m^2	0 (0.0)	36 (100.0)	–
18.5-<25 kg/m^2	15 (10.0)	135 (90.0)	1.00 (Reference)
25-<30	18 (16.5)	89 (83.5)	1.85 (0.88–3.90)
≥30	68 (32.9)	139 (67.1)	4.40 (2.38–8.10)[b]
TBF			
8–20%	2 (1.5)	128 (98.5)	1.00 (Reference)
>20%	99 (26.8)	271 (73.2)	23.0 (5.60–95.6)[b]
VFL			
Normal (1–9)	6 (3.6)	150 (96.4)	1.00 (Reference)
High (10–14)	34 (19.0)	145 (81.0)	6.0 (2.40–14.7)[b]
Very high (15–30)	61 (37.0)	104 (63.0)	15.0 (6.20–35.7)[b]

[a] Odds ratio adjusted by age of the studied group.
[b] Significant.

Our study showed mean penile length of studied group (14.2 ± 2.8 cm) and the linear regression analysis between penile length and the studied body fat variables. The penile length is found to be significantly decreased by 0.04 cm (β = −0.04) for each one kg/m2 increase in BMI. Although insignificant, increasing TBF by 1% was associated with decrease in penile length by 1.3 cm (β = −1.3). Also, increasing VFL by one unit is found to decrease the penile length by 0.05 cm (−0.05), but not significant. The variations found in the studied body fat variables (BMI, TBF, and VFL) was only explain 1% of the variations observed in the penile length among the studied group (R2was 0.01 for each studied body fat variable), (Table 3).

Our study presented the mean penile length, AIPE, Erectile function and satisfaction by BMI categories. There are significant differences among all the studied BMI categories and all the studied sexual function variables. The mean penile length, mean AIPE scoring, erectile function and satisfaction scoring was the lowest among obese group compared with other BMI categories, (Table 4).

Frequency of ED among the studied 500 cases is 11% (55/500 males). The mean scoring of IEEF5 was higher in the mild followed by mild to moderate, moderate and the lower score was for severs ED category. The mild ED was found among patients with mean of BMI of 33.2 ± 7.9 while moderate ED was found in patients with BMI of 35.5 ± 9.2. The mild ED was found in patients with mean TBF% of 0.36 ± 0.1and VFL of 14.5 ± 4.3 while the moderate ED was found in patients with mean TBF% of 0.37 ± 0.09 and VFL of 15.3 ± 4.1, (Table 5).

Table 3. Mean penile length and linear regression analysis between penile length and the studied body fat variables.

Mean penile length	14.2 ± 2.8 cm		R^2	*P* value
	Intercept	β coefficient		
BMI	14.1	−0.04	0.01	0.01*
TBF	13.3	−1.3	0.01	0.24
VFL	13.5	−0.05	0.01	0.06

Table 4. Mean penile length, AIPE, IIEF5 Erectile function domain, and IIEF5 satisfaction domain in relation to BMI categories.

Sexual functions	BMI kg/m^2				*P* value
	<18.5	18.5-<25	25-<30	≥30	
Penile length	15.5 ± 2.4	14.1 ± 2.5	14.1 ± 2.5	14.0 ± 2.0	0.04[a]
AIPE	33.1 ± 1.3	32.0 ± 3.7	30.1 ± 5.1	29.5 ± 5.2	<0.0001[a]
Erectile function domain	19.1 ± 1.0	18.5 ± 1.1	19.0 ± 1.2	18 ± 1.0	0.002[a]
Satisfaction domain	4.5 ± 0.6	4.2 ± 0.6	4.4 ± 0.7	4.0 ± 0.5	0.06

[a] Significant.

Table 5. IEEF5 scoring for ED cases and its relation to BMI, TBF% and VFL.

ED categories	*N* (%)	Mean IIEF score	BMI	TBF%	VFL
Mild	20 (36.4)	20.4 ± 1.3	33.2 ± 7.9	0.36 ± 0.1	14.5 ± 4.3
Mild to moderate	14 (25.5)	19.9 ± 1.2	31.5 ± 8.1	0.35 ± 0.1	15.1 ± 4.8
Moderate	20 (36.3)	11.8 ± 1.5	35.5 ± 9.2	0.37 ± 0.09	15.3 ± 4.1
Severe	1 (1.8)	6 ± 1.0	21.1 ± -	0.20 ± -	13.0 ± -
P value		<0.0001[a]	<0.0001[a]	<0.0001[a]	<0.0001[a]

[a] Significant.

Frequency of PE among the studied 500 cases is 20.2% (101/500 males) The mean scoring of AIPE was higher in the mild followed by mild to moderate, moderate and the lower score was for severs PE category. The severity of PE was found among patients with BMI 34.4 ± 7.3, on the contrary the mild PE was found among patients with BMI 36.8 ± 5.8. Similarly, the mild PE was found among patients with higher TBF% and VFL, (Table 6), Figs. 1 and 2.

4. Discussion

Particularly of interest to health care personnel are human body composition indices. An evaluation of an individual's body composition offers valuable information regarding their nutritional status as well as their functional capability. Demand for body composition analyses with elevated levels of sensitivity and precision has escalated in tandem with the frequency of obesity and lifestyle-related illnesses.[1]

Table 6. AIPE scoring for PE cases and its relation to BMI, TBF% and VFL.

PE categories	*N* (%)	Mean AIPE score	BMI	TBF%	VFL
Mild	19 (18.8)	27.9 ± 1.0	36.8 ± 5.8	0.40 ± 0.08	16.9 ± 2.7
Mild to moderate	10 (8.9)	26.1 ± 1.1	35.4 ± 6.1	0.38 ± 0.09	15.7 ± 3.1
Moderate	28 (27.7)	23.1 ± 1.3	31.6 ± 7.9	0.33 ± 0.08	14.3 ± 3.8
Severe	44 (43.6)	18.1 ± 0.7	34.4 ± 7.3	0.37 ± 0.01	15.0 ± 3.2
P value		<0.0001[a]	<0.0001[a]	<0.0001[a]	<0.0001[a]

[a] Significant.

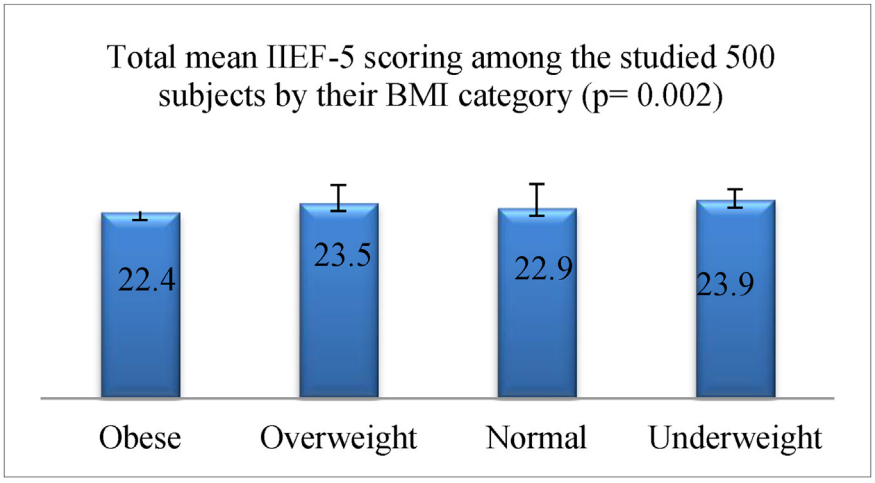

Fig. 1. Total mean scoring of IIEF-5 by BMI categories. IIEF-5, International Index of Erectile Function-5.

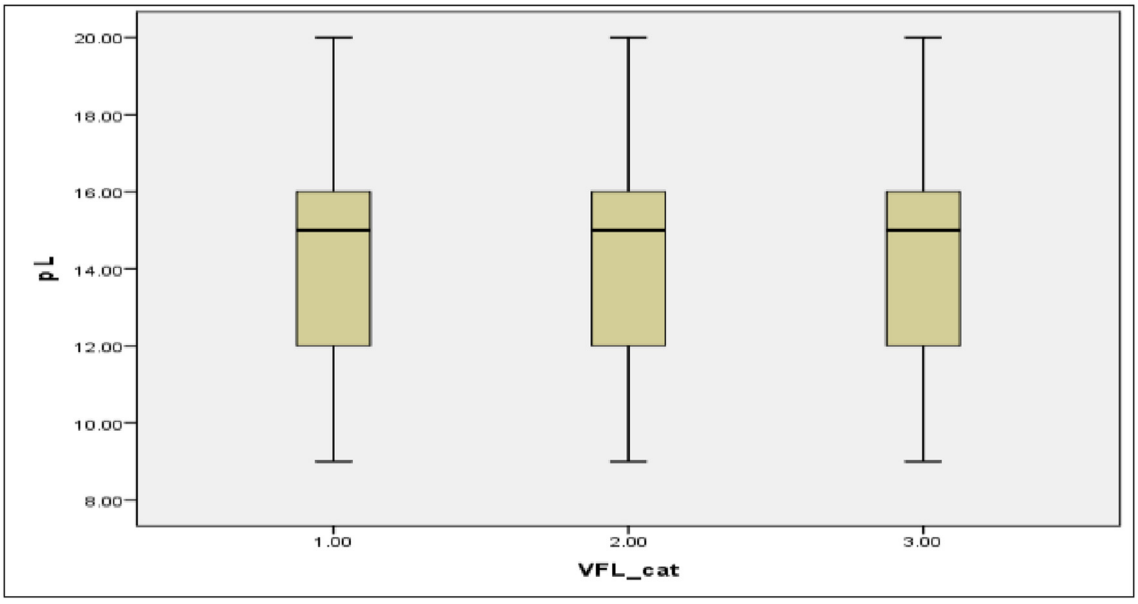

Fig. 2. Box plot of penile length by VFL categories.

Erectile dysfunction, premature ejaculation, diminished libido, delayed or inhibited arousal, and physical abnormalities of the penis are all symptoms of male sexual dysfunction, which is one of the most prevalent health issues in the world.[2]

Our results showed that the risk and severity of erectile dysfunction assessed by IEEF5 was significantly increased among subjects with BMI greater than 30 kg/m^2, TBF greater than 20%, high VFL, and very high VFL.

Our results agreed with Pizzol *et al.*[6] that showed that erectile dysfunction was related to significant greater values of BMI.

Our results supported with Esposito *et al.*[7] who aimed to determine great proportions of erectile dysfunction in men with the metabolic syndrome showed that there was an elevation in the frequency of ED (International Index of Erectile Function (IIEF) score <21) with the presence of increasing numbers of the components of the metabolic syndrome.

Our results supported with Dursun *et al.*[8] who aimed to ascertain whether an elevated visceral adiposity index correlated with sexual dysfunction in men, it was discovered that men with ED had significantly greater VAI levels (*P* 0.001).

Our findings showed that the risk of premature ejaculation was significantly elevated among subjects with BMI greater than 30 kg/m^2. And the risk of premature ejaculation was strongly and significantly associated with TBF greater than 20%, high VFL, and very high VFL.

Our results supported with Azab *et al.*[9] who aimed to determine the prevalence of atherosclerosis and associated factors in both Types of premature Eeaculation showed that APE was significantly related BMI greater than or equal to 25 kg/m^2.

Also, our results supported with Bolat *et al.*[10] who aimed to determine the relationship between acquired premature ejaculation and metabolic syndrome showed that (BMI) was significant risk factors for premature ejaculation.

Our results showed that the penile length is found to be decreased by 0.04 cm ($\beta = -0.04$) for each one kg/m^2 increase in BMI. Although insignificant, increasing TBF by 1% was associated with decrease in penile length by 1.3 cm ($\beta = -1.3$) it is insignificant and increasing VFL by one unit is found to decrease penile length by 0.05 cm (−0.05), but not significant.

Our results supported with Söylemez *et al.*[11] who aimed a study was conducted to investigate the correlation among penile size and somatometric parameters in a cohort of healthy young males. The findings revealed mild positive correlations among the average circumference length and BMI. However, no significant correlations were seen among both flaccid and stretched lengths and BMI.

Our results in consistent with Shalaby *et al.*[12] who aimed to evaluate the penile length somatometric parameters association in healthy Egyptian men. They showed that there was no significance correlation between penile length and waist circumference (visceral fat).

4.1. Conclusion

Regarding to our results we concluded that the risk and severity of erectile dysfunction was significantly increased with obesity (BMI>30 kg/m^2), TBF

greater than 20%, and visceral obesity (VFL>9). Also, the risk of premature ejaculation was also significantly increased obesity (BMI>30 kg/m^2), TBF greater than 20%, and visceral obesity (VFL>9). Moreover, there is no significant correlation between (BMI, TBF and VFL) and penile length.

Ethics information

Its was approved by faculty.

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Conflicts of interest

No conflict of interest.

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