Effect of Cognitive behavior theory-based educational intervention on obese adults' knowledge about psychological stress

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تأثيرالتداخل التعليمي القائم على نظرية السلوك المعرفي في معارف البالغين البدناء حول التوتر النفسي

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المستخلص

الخلفية:التوتر لفترات طويلة يمكن أن يكون عامل خطر لزيادة الوزن أو تفاقمه. علاوة على ذلك، تعتبر التدخلات النفسية السريرية والعلاجات النفسية مكونات أساسية لتحفيز المرضى على تغيير أنماط حياتهم وفقدان الوزن بمساعدة فرق متعددة التخصصات، حيث ترتبط السمنة بالعوامل النفسية.:تهدف الدراسة لتقييم تأثير التدخل التعليمي الذي تقوده الممرضة على معرفة البالغين الذين يعانون من السمنة المفرطة حول تأثير الضغط النفسي على السمنة. تم تطبيق تصميم الدراسة القبلية (تصميم المجموعة الواحدة للاختبار القبلي والاختبار البعدي) لمجموعة واحدة من العينات خلال الفترة من ١٩ يناير ٢٠٢٣ إلى ١١ أبريل ٢٠٢٤. عينة غير احتمالية (عينة مقصودة) مكونة من ثلاثة وخمسين المشاركون في مركز السمنة والتغذية العلاجية في مستشفى بغداد التعليمي في مجمع مدينة الطب. استخدم الباحث النظرية السلوكية المعرفية لتصميم التداخل لهذه الدراسة.

أظهرت النتائج من اختبار t المقترن فرقًا متوسطًا كبيرًا للغاية (٠,٧٢٤) بين فترتي الاختبار قبل وبعد الاختبار فيما يتعلق بمعرفة البالغين الذين يعانون من السمنة المفرطة تجاه تأثير الإجهاد على السمنة بمستوى معنوية (P <0.000) بالإضافة إلى أن هذا أفادت النتائج أن حجم التأثيركان كبيرا حسب ما أشار (كوهين د) D = 2.75.

بناء على نتائج الدراسة الحالية، كان التداخل التعليمي بقيادة الممرض فعالا في تحسين السمنة. معرفة البالغين بتأثير الضغوط النفسية على السمنة في ضوء العلاج السلوكي المعرفي

يوصى بشدة بزيادة معرفة البالغين الذين يعانون من السمنة المفرطة فيما يتعلق بتأثير الضغط النفسي على السمنة من خلال تطبيق التداخل التعليمي بقيادة الممرضات والذي يعد أداة مفيدة للأشخاص الذين

يعانون من السمنة المفرطة والذين يرتادون مراكز السمنة والتغذية العلاجية الموجهة بالعلاج السلوكي المعرفي.

Abstract:

Background: Prolonged stress can be a risk factor for weight gain or its worsening. Moreover Clinical psychological interventions and psychotherapies are essential components for motivating patients to change their lifestyles and lose weight with the assistance of multidisciplinary teams, as obesity is linked to psychological factors. To evaluate the impact of nurse-led educational intervention on obese adults' knowledge about the effect of psychological stress on obesity. A pre-experimental (one group pretest-posttest design) study design was applied for one group of samples during the period of January 19, 2023, to April 11, 2024. A non-probability (purposive sample) of fifty-three participants in the obesity and therapeutic nutrition center at Baghdad Teaching Hospital in the medical city complex. The researcher use cognitive-behavioral theory to design the intervention for the present study. The analysis of the data was done using SPSS version 22.0.The findings from paired t test demonstrated a highly significant mean difference (0.724) between the pre- and post-test periods regarding obese adults' knowledge toward the effect of stress on obesity (p 0.000) furthermore this table reported that the effect size of the educational intervention was large as indicated by *(*Cohen's d) D=2.75.Conclusions: Based on findings of the current study, the nurse-led educational intervention was effective in improving obese adults' knowledge about the effect of psychological stress on obesity according to Cognitive behavior therapy. It is highly recommended to increase the obese adult's knowledge regarding the impact of psychological stress on obesity through applying nurse-led educational intervention which is beneficial tool for obese population who are attending in the obesity and therapeutic nutrition centers guided by Cognitive behavior therapy

Keywords: impact; obese adults; psychological stress; obesity

Introduction:

Overweight and obesity represent major public health issues that affect more than 1.9 billion and 650 million people worldwide, respectively (Loh et al., 2023). According to The World Health Organization (WHO), obesity is defined as *"*abnormal or excessive fat accumulation that may impair health"(Westbury et al., 2023). (Powell-Wiley et al., 2021) mentioned that obesity is a disorder, in which increase in body fat mass occurs(Chiolero, 2018).The obese individuals can be classified and identified when their body mass index (BMI) exceeds 30 kg/m2. Furthermore WHO determined 25–30 kg/m2 as overweight (Heymsfield & Wadden, 2017).The review study stated that many years have been spent researching the connection between mental health and being overweight. Increases in the caliber of psychological, mechanistic, and epidemiological studies have improved our comprehension of the connections (Steptoe & Frank, 2023). Obesity has a significant negative impact on psychological and psychosocial functioning and has a significant financial impact on global health care costs. (Westbury et al., 2023). Scientists studied the relationship between adiposity and the magnitude of cardiovascular reactions to acute psychological stress. Measurements of blood pressure and heart rate were applied to evaluate the brief effects of stress. The ghrelin hormone plays an essential role in stress, emotions and the eating process. Interpersonal stressors have been linked with a Ghrelin and leptin concentrations which are associated with obesity and weight gain (Mohammed & Sajit, 2016). Prolonged stress can be a risk factor for weight gain, dyslipoproteinemia, or coronary artery disease or its worsening (Petit Francis et al., 2017).Sign of maladaptation to chronic environmental stress exposure can cause an accumulation of fat in visceral adipose tissue around the waist. Stress may drive dysregulation of homeostasis and obesity (Roy et al., 2021). According to some researchers, people with obesity and people of normal weight experience distinct effects from passive and active stressors on a particular cardiovascular, immunological, or endocrine disease (Kumar et al., 2022). There are now known neural mechanisms connected to behaviors of stress. These

mechanisms imply novel approaches to the prevention and treatment of stress-related psychopathologies. Psychopathologies associated with stress have been the focus of studies on psychological stress (Isaa & Mohammed, 2021). Clinical psychological interventions and psychotherapies are essential components for motivating patients to change their lifestyles and lose weight with the assistance of multidisciplinary teams, as obesity is linked to psychological factors. Successful strategies include both new and old cognitive behavioral techniques in addition to medical protocols and rehabilitation procedures. Patients can benefit from long-term participation in successful and long-lasting weight loss programs with the assistance of clinical and health psychology (Castelnuovo et al., 2017).The current study purpose to Effect of Cognitive behavior theory-based educational intervention on obese adults' knowledge about psychological stress**.** The nurse-led educational intervention focuses on measures to relieve psychological stress that include perform exercise, eating healthy diet, get good sleep and apply relaxation techniques. This study hypothesized that there is an effect of cognitive behavior theory-based educational intervention on obese adults' knowledge about psychological stress

Methodology:

A pre-experimental study A pre-experimental (one group pretest-posttest design) design was applied approach for one group of sample during the period of 19th of September 2023 to the 11th of May 2024. According to (Cohen, 1988) to estimate the sample size, the researcher select effect size 0.5, significance level 0.05, and statistical power 0.80, the required sample was 63. During data collection 10 out of 63 drop out due to not meeting inclusion criteria and not adhering with study intervention time appointment therefore the recruited sample was 53 participants as A non-probability (purposive sample) in the obesity and therapeutic nutrition center at Baghdad Teaching Hospital in the medical city complex. The inclusion criteria were as follows: Patient with BMI > 30, Adult patient (age ≥18 years) and Patient knowledge score less than 60 %

at pre-test period. To accomplish the study, the researcher has constructed a questionnaire format which was based on a review of the literature related to the impact of psychological stress on obesity (Baygi et al., 2023;Shaji et al., 2023;Steptoe & Frank, 2023) . The questionnaire consisted of two parts which are: part one: includes self-administrated sheet related to the demographic characteristics which consist of 8 variables which are sex, education, age, marital status, occupation, income level, place of residency and presence of non-communicable disease. Part two: relates to obese patient knowledge about impact of stress on obesity which of (10) items, which are scored as follows: 2 for (I Know) and 1 for (I do not know) the questions were developed from content of education sessions as recommended by previous studies. Validity of the study instruments are determined by the panel of (10) experts, who had more than five years' experience in their fields. The Pilot study was conducted to ensure clarity, and time required, and the reliability of the research instrument which was evaluated by Cronbach's Alpha (0.905) to ensure their internal consistency. The nurse-led educational intervention is carried out in the continuing education unit of obesity and therapeutic nutrition center at Baghdad teaching hospital in medical city for the period from 1st to 27th of December 2023, one sessions per week, the duration of each session was 45 minutes, first two sessions were about (overview of obesity) that covered following topics: the morbid obesity, the types of obesity, the causes of obesity, diagnosis of obesity, available treatment of obesity complications of obesity. The following tools were used to deliver educational intervention as follows: the researcher used whiteboard, presentation by smart board, and Booklet given at the end of the first session. The second two sessions were teaching about: psychological stress, impact of psychological stress on obesity, relaxation techniques to reduce psychological stress, negative thought patterns related to stress, healthy behaviors to reduce stress, stress management techniques, activities that reduce stress and. In addition to discussing with study participants and answering any concerns, the relationship between thoughts, emotions, and behaviors is depicted by the cognitive triangle.

Cognitive behavior therapy (CBT) is based on this concept. The researcher use cognitive-behavioral theory to design the intervention for the present study through following components: Through cognitive restructuring, the researcher teaches participants how to recognize and question harmful thought patterns associated with stress and eating habits. Behavioral activation through the Promotion of Stress-Reduction and Health-Promoting Activities, Like Exercise and Relaxation Techniques, Psychoeducation: Stress the mind-body connection and explain how stress impacts the body and leads to obesity. Building Skills: Provide coping mechanisms and stress-reduction methods (such as deep breathing exercises and mindfulness). To verify effectiveness if educational intervention, based on CBT the researcher evaluate Knowledge at Pre- and post-intervention about the relationship between stress and obesity.(Hofmann et al., 2012)

Analysis of data was by using SPSS version 22.0.furthermore frequency, percentage, mean of score, and standard deviation, matched paired-samples t-test and ANOVA were applied to analyze and achieve the study objectives. According to (Lakens, 2013), the effect size (Cohen's d) was classified as follows: small effect size: d = 0.20 medium effect size: d = 0.50 and large effect size: d = 0.80

Results:

Table (1): Characteristics of Study Sample

Variables	Classification	Frequency	Percent
Age groups	28-37 years	11	20.8
	38-47 years	24	45.2
	48-57 years	18	34.0
	Total	53	100.0
	Mean ∓S.D.	31.3±0.735	
Sex	Male	23	43.4
	Female	30	56.6
	Total	53	100.0
Occupation	Employer	26	49.1
	Unemployed	5	9.4
	Housewife	22	41.5
	Total	53	100.0
Marital Status	Single	4	7.5
	Married	36	67.9

	Divorced	2	3.8
	Widow	11	20.8
	Total	53	100.0
Economic Status	Enough	37	69.8
	Barely enough	14	26.4
	Not enough	2	3.8
	Total	53	100.0
Residency	Urban	45	84.9
	Rural	8	15.1
	Total	53	100.0
Educational Level	Primary	12	22.6
	Intermediate	12	22.6
	Secondary	9	17.0
	Institute	15	28.4
	College	5	9.4
	Total	53	100.0
Do you suffer from Chronic Diseases	No	25	47.2
	Heart Disease	7	13.2
	Diabetes Mellitus	5	9.4
	Asthma	3	5.6
	Arthritis	11	20.8
	Kidney Diseases	2	3.8
	Total	53	100.0

F=Frequency, %=Percentage, N= Sample size, M=Mean, SD=Standard deviation

Table (1) Present that 45.2% of obese Patients at age group 38-47 years old the mean and standard deviation was (31.3±0.735). 56.6 % of them was females, 49.1% was employers, 67.9% of them was married , with enough income which of 69.8%, 84.9 % of them was live at urban area, 28.4 of them was graduated from institute as a level of education. Related to question "Do you suffer from chronic diseases, heart disease"? The high percentage 47.2% of samples answered as "No".

Table (2): Knowledge of obese patients about The effect of psychological stress at Pre and Post Test.

NO	Variables	Pretest				Posttest			
		Correct resp.		Incorrect Resp.		Correct Resp.		Incorrect Resp.	
		F	%	F	%	F	%	F	%
1	Some people use excessive amounts of alcohol, caffeine, or smoke as a coping mechanism for stress.	17	32.1	36	67.9	43	81.1	10	18.9
2	Physical activity is almost a method to release psychological stress	24	45.3	29	54.7	43	81.1	10	18.9

3	applying meditation and visualization at any time and place, such as (on the bus) will reduce psychological stress	**14**	**26.4**	**39**	**73.6**	**39**	**73.6**	**14**	**26.4**
4	Social media is a good method to relieve psychological stress	**13**	**24.5**	**40**	**75.5**	**48**	**90.6**	**5**	**9.4**
5	yoga and deep breathing exercises relieve stress.	**13**	**24.5**	**40**	**75.5**	**42**	**79.2**	**11**	**20.8**
6	Sleep deprivation can lead to psychological stress	**15**	**28.3**	**38**	**71.7**	**49**	**92.5**	**4**	**7.5**
7	visiting places of worship may help you to get rid of psychological stress	**18**	**34.0**	**35**	**66.0**	**48**	**90.6**	**5**	**9.4**
8	watching a movie with family or having a cup of coffee with a friend may help relieve stress	**19**	**35.8**	**34**	**64.2**	**47**	**88.7**	**6**	**11.3**
9	Listening to soothing music or the Qur'an relieves stress well.	**17**	**32.1**	**36**	**67.9**	**41**	**77.4**	**12**	**22.6**
10	Doing household cleaning, riding a bicycle, swimming, or lifting weights will improve your mood	**20**	**37.7**	**33**	**62.3**	**43**	**81.1**	**10**	**18.9**
	Total		**32.07**		**67.93**		**83.59**		**16.41**

Freq.=Frequency, %=Percentage., resp.=response

Table (2) reported that the total knowledge about effect of psychological stress before intervention had 67.93% of correct responses while at posttest it was improved to 83.59%.

Table (3):Impact of Nurse-led educational intervention on obese adults' knowledge about effect of psychological stress on obesity.

	Period	N	Mean	Mean difference	SD	t-value	d.f	*Sig.*	*the effect size (Cohen's d)*
Patients Knowledge									
	Pre-test		1.12		.194				
	Post-test	53	1.84	0.72	.191	20.017	52	***.000***	***D=2.75***

In this Table (3), paired t test demonstrated a highly significant mean difference (0.724) between pre and posttest *at p* (0.000), regarding obese adults' knowledge toward effect of stress on obesity, furthermore this table reported that the effect size of the educational intervention was large as indicated by (Cohen's d) D=2.75.

Table (4):Differences between Effect of Nurse-led educational interventions on obese adult's knowledge with their socio-demographic variables

Variables		Sum of Squares	Df	Mean Square	F	Sig. P≤0.05
Age group	Between Groups	1.247	3	0.416	0.759	0.522
	Within Groups	26.828	49	0.548		
	Total	28.075	52			
Occupation	Between Groups	4.553	3	1.518	1.723	0.174
	Within Groups	43.146	49	0.881		
	Total	47.698	52			
Marital status	Between Groups	1.204	3	0.401	0.477	.700
	Within Groups	41.249	49	0.842		
	Total	42.453	52			
Economic Status	Between Groups	.924	3	0.308	1.008	0.397
	Within Groups	14.963	49	0.305		
	Total	15.887	52			
Educational Level	Between Groups	1.655	3	.552	2.840	0.047
	Within Groups	9.515	49	.194		
	Total	11.170	52			

Table (4) revealed that there are no significant differences between Effectiveness of nurse-led educational intervention on obese adult knowledge about the effect of psychological stress on obesity and demographic characteristics at P > 0.05 level. In contrast level of education had significant difference with obese adults' knowledge at P 0.047.

Table (5): Differences between impact of Nurse-led educational interventions on obese adults' knowledge with their socio-demographic variables

		Mean	SD	t-value	d.f	*Sig.*
Sex Type	Male	1.84	.179	0.244	52	*0.341*
	Female	1.85	.203			
		Mean	SD			
Residents	Urban	1.8444	.20148	0.009	52	*0.229*
	Rural	1.8438	.12939			

SD: Standard deviation, t: t-test, d.f: Degree of freedom, sig.: significance level

Findings found no significant differences between Effectiveness of Nurse-led educational intervention on obese adults

Knowledge about effect of psychological stress on obesity with (Sex) (*p= 0.341*) and (Residents) (p= 0.229).

Discussion:

Present study was to evaluate the obese adults' knowledge about the effect of psychological stress on obesity. The study sample contain of (53) participant from Obesity and Therapeutic Nutrition Center at Baghdad Teaching Hospital in Medical City. Table (1) shows distribution of studied group concerning demographic characteristics, such that "age groups, sex, occupation, level of education, marital status, level of income, residency and presence of non-communicable disease ". Results in this table revealed that (38-47 years) age group as referred with high percentage (45.2%), and 34% of them were of age group (48-57 years), while only (20.8 %) were age group (28-37). With M= 31.3 and SD= 0.735. This result similar to study applied in Baghdad Teaching Hospital which was conducted at Iraqi center for heart diseases in which the results reported (50-59) age group as referred with high percentage (47.2%) of study sample.(Majeed, 2017;(Isam & Hassan, 2023)

The results show that are 56.6 % of study sample was females, the study conducted by Waheed & Hassan (2021) to assess the effectiveness of a daily living activities program on the physical ability of patients with coronary artery disease undergoing a stress test in Dhi Qar Governorate, in AL- Nasiriyah Heart Center on A non-probability (purposive) sample consists of (40) coronary artery disease patients, and study conducted by Ibrahim & Bakey to evaluate effectiveness of instruction program for residents of geriatric-care homes about personal hygiene in al cyelakh geriatric care home. reported that more than half of study sample (57.5) were female [(11)(18)]. But disagree with study carried out by Shinjar et al (2018) that titled (Effectiveness of an Education Program on Hemodialysis Patients, Knowledge towards Dietary Regimen at Al-Hussein Teaching Hospital in Al-Nasiriyha City) in AL-Hussein Teaching Hospital in AL-Nasiriyah City on non-probability sample of 50 patients, and study applied by Khudhair & Ahmed that titled

(Type 2 Diabetic Patients' Knowledge Regarding Preventive Measures of Diabetic Foot). that represent the majority of study sample (72%) were male (Shinjar et al., 2018;Khudhair & Ahmed, 2022)

High percent in study sample 49.1% was employers, 67.9% of them was married , with enough income which of 69.8%, 84.9 % of them was live at urban area, 28.4 of them was graduated from institute as a level of education. Finally related to question Do you suffer from chronic diseases, heart disease? the most answers were 47.2% answer with no. A study conducted by Athbi & Hassan (2019) to assess Knowledge of patients with coronary heart disease about secondary prevention measures at Karbala Center for Cardiac Disease and Surgery that used A non-probability sampling method consists of 64 patients was selected purposively based on the study criteria, reported that are 48% of patients were more than 50 years, the mean score of the participants age were 56.2. More than one half of the study sample are male (56.3%), regarding the level of education the greater number of them have had a primary school education and accounted for (40.6%), and (37.5%) of them housewives. approximately more than one half of the patients involved in this study was identified as a known case of DM and / or hypertension (Athbi & Hassan, 2019)

The Present study evaluated the obese adults' knowledge about the effect of psychological stress on obesity. Obesity is a prominent risk factor for many diseases that cannot be communicated, most importantly cardiovascular diseases, therefore the interventions that manage obesity and overweight issues are crucial to return the obese adults to normal BMI (Baygi et al., 2023). Prolonged stress can be a risk factor for weight gain, and other life-threatening disorders such as coronary artery diseases (Petit Francis et al., 2017).The literature review the need to highlight shadow on the psychological well-being of young adults with obesity especially the psychological factors (Alves et al., 2024) So empowering the individuals' knowledge regarding relationship between stress and obesity to promote wellness and prevent negative health consequences.

The outcomes of the current research reported the total knowledge level of study respondents about effect of psychological stress on obesity at pretest was 67.93% of responses within correct answers while at posttest the percentage of correct answers rises to 83.59%,. Also the results showed a highly significant mean differences between pre and posttest at p (0.000), regarding obese adults' knowledge toward effect of stress on obesity, based on these findings it can be inferred that the educational intervention was effective in improving adults' knowledge about impact of psychological stress on obesity, This finding agrees with study done by Al-Hamad & Hassan, (2023) who performed quasi-experimental study on 54 samples who were separated into two intervention and control groups. The intervention involved educating participants with peptic ulcer about physical and psychological status. The results found no discernible difference in the mean participant knowledge score between the two groups (the intervention and control group at P >0.05) at pre-test period. Following the education, the results found a statistically significant mean difference scores at P 0.05 between the two groups.

Findings from an interventional study confirmed that the psychosocial intervention has positive effect on population (Datukali & Pangandaman, 2024). Moreover, the effect of psychological interventions related to overweight and obesity were studied by a systematic review and meta-analysis approaches in which the outcomes were in agreement with our results (Baygi et al., 2023).

Similar results found by Abid & Mohammed, (2022) who performed a quasi-experimental study to assess effectiveness of an instructional program on patients' knowledge about home safety while receiving Anti-Cancer Medications at Al-Karama Teaching Hospital in Al-Kut City. The findings showed that the evaluation of patients' knowledge in the study group throughout three periods of measurements was assessed, a low means of score (1.23) before applying the instructional program. Comparatively, most of the studied items had a high mean of score (1.77 and 1.70) in post-test I and post-test II after implementation of the program.

The results of table (4) revealed that there were no significant differences between impact of nurse-led educational intervention on obese adult knowledge about the effect of psychological stress on obesity and demographic variables which are (age, employment, marital status and economic level at $P \leq 0.05$ level, In contrast level of education had significant difference with obese adults' knowledge at P 0.047. Similar findings from the study conducted by (Hamdi & Jasim, 2022), to assess the effect of an educational intervention on diabetic patient's knowledge regarding complications of diabetes mellitus at early stage. It may be comprehended that high educational level had an impact on level of knowledge.

In order to confirm that the study subjects are related by the examined instrument after completing the recommended intervention, comparisons of the significance of testing hypotheses during the pre and post period are also computed. Findings demonstrated that obese adults' knowledge about the effect of psychological stress on obesity recorded very significant variations at P 0.01 between pre- and post-test. Thus, it disproves the null hypothesis. Furthermore we accept the alternative hypothesis in which the study samples benefited significantly from receiving 21 days of education about the effect of psychological stress on obesity.

Conclusions:

Based on findings of the current study, the nurse-led educational intervention was effective in improving obese adults' knowledge about the effect of psychological stress on obesity according to Cognitive behavior therapy. The researcher use cognitive-behavioral theory. Furthermore, the educational level may be a factor that affect on knowledge level of obese adults; therefore in future it should be taken in consideration when tailoring the educational interventions. Frequent interruption for calling participant for reason or another, lack of the relevant published literature and research studies, and sample of the study was purposive which may limit generalizability of the findings were major limitations for the current study.

Recommendations:

It is highly recommended to increase the obese adult's knowledge regarding the impact of psychological stress on obesity through applying nurse-led educational intervention which is beneficial tool for obese population who are attending in the obesity and therapeutic nutrition centers guided by Cognitive behavior therapy, in addition future studies are needed in other settings and in different designs with large samples to explore more findings about educational intervention for obese population.

Acknowledgement

The authors thank all participants of the Obesity and Therapeutic Nutrition Center at Baghdad Teaching Hospital in Medical City for their cooperation in completing this study. The researchers acknowledge all efforts provided from faculty of nursing at university of Baghdad. Furthermore, the authors declare do not receive any funding to complete this study.

Conflict of Interest

The authors declare that they have no competing interests.

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