Effectiveness of Lifestyle Intervention on Recovery of Patients with Bipolar Disorders

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Abstract

Background: The basis of care in patients with bipolar disorder is lifestyle evaluation and treatments, which can serve as a starting point for therapy and can be used in conjunction with psychological and pharmaceutical therapies to enhance positive outcomes and lessen negative ones. Additionally, integrating several lifestyle-based methods (such food and exercise therapies) may improve the effectiveness of treatment and the healing process**. Aim:** evaluate the effectiveness of lifestyle intervention on recovery of patients with bipolar disorders. **Design:** Quasi experimental design. **Setting:** The inpatient psychiatric department of Tanta University, and The Neurology, Psychiatry, and Neuro-Surgery Center. **Subjects:** A convenient sample of 60 patients with bipolar disorders were allocated randomly to experimental and control group (30 patients in each group). **Tools: Tool I:** Socio-demographic and clinical characteristics, Tool **II:** Simple lifestyle indicator questionnaire (SLIQ). Tool **III:** bipolar recovery questionnaire (BRQ). **Results**: there was statistical significant difference between experimental and control group after implementing lifestyle intervention in all dimensions of lifestyle scale except smoking subscale. **Conclusion:** lifestyle intervention promotes recovery and enhances daily life activities in patients with bipolar disorders except smoking habit needs more effort and variety of interventions to eliminate it. **Recommendation:** Different interventions directed to modifying lifestyle activities need to be planned and implemented for patients with bipolar disorders to improve their mental well-being and enhance their recovery.

Key words: lifestyle intervention, bipolar disorder, mental health recovery

Introduction

Bipolar disorder (BD) is a chronic and cyclic mental disorder, characterized by irregular mood swings between mania/hypomania and depression with a 3% to 5% lifetime prevalence. The condition causes numerous limitations in daily functioning, increasing the expenditures for sufferers as well as society. [1-3]. Because of its early onset and chronic nature throughout the lifespan, it is regarded as the second most common cause of disability. Bipolar disorders are characterized by increasing in the frequency and severity of affective episodes, as well as recurrence rates of 50–90%. [4,5].

BD is linked to a high incidence of medical disorders such obesity, type 2 diabetes (T2D), cardiovascular disease (CVD), and stroke in addition to mood and cognitive abnormalities. [6,7]. Unfortunately, these health issues could have a detrimental effect on how the disease progresses. for example, concomitant T2D is linked to a higher risk of recurrent episodes, frequent hospital stays, suicidality, and a subpar response to traditional mood stabilizers. The significant

percentage of obese patients who experience a depressed recurrence suggests that obesity may be a risk factor for depression relapse. [8-10].

There are many factors that contribute to the development and maintenance of BD, among these factors is an unhealthy lifestyle [9,14] . Unhealthy lifestyle habits such as smoking, substance misuse, physical inactivity especially in depressive phases, poor dietary choices, and sedentary life contribute to the development and severity of the physical ailments and clinical symptoms in BD. Consequently, contribute to poor health outcomes and reduce cost-effectiveness of therapeutic interventions in BD [15].

Health-promoting lifestyles consist of a multidimensional pattern of perceptions and activities that are self-initiated and are involved in maintaining and promoting health and self-improvement. Healthy lifestyles mean to engage in regular physical activity, to refrain from smoking, limit alcohol consumption, manage life stressors, and to eat healthy food in order to prevent overweight. These behaviors contribute to not only better physical health, but also foster mental well-being [16].

Although these activities do not always prevent BD, they frequently assist people in maintaining or improving their health through a holistic strategy that involves lowering body mass index and other risk factors for metabolic syndrome. Additionally, it reduces the risk and morbidity of bipolar disorder individuals who are overweight, have cardiovascular disease, or have diabetes, which are illnesses that can be avoided. [17].

Therefore, the promotion of healthy lifestyles among patients with bipolar disorder is an integral part of their recovery [16]. In this regard, the notion of recovery as a new medical paradigm for psychiatry emerged, which denotes the growth beyond the devastating effects of mental illness, including symptomatic recovery (resolution of symptoms), and the formation of new meaning and purpose in one's life [18]. Recovery is the ability to live a fulfilling, hopeful, and productive life despite the constraints brought on by sickness. [19]. Such healing or recovery means that people with bipolar disorder believe they are regaining their sense of identity and purpose, both inside and outside the boundaries of their condition. Recovery is characterized by its key components of hope, optimism, and positive identity[20].

In literature, there are guiding principles to define mental health recovery instead of a sole definition; it includes the ability to regulate one’s life rather than returning to premorbid level of functioning. Instead of emphasizing complete symptom relief, it places an emphasis on resilience and control over challenges and daily life. [21] . The goals of recovery are to assist those who are struggling with mental diseases to see beyond merely existing and surviving. It motivates them to advance and establish new objectives. It promotes the idea that they should move on with their life, engage in activities, and form relationships with people who will give them significance. [22,23].

Acceleration of recovery process has become the aim of mental health systems worldwide for people with psychiatric disorders. There is data emphasized on the significance of healthy life style as a key technique to nurture recovery in people with psychiatric disorders [24] .

Significance of the study

Adults with BD have increased rates of morbidity and mortality, which pose a public health emergency because they often die 25 years earlier than the normal population primarily as a result of medical diseases that can be avoided, such diabetes and cardiovascular disease.

High rates of smoking, poor eating patterns, obesity, and a sedentary lifestyle are all modifiable risk factors that contribute to and exacerbate their physical health. Moreover, the high frequency of medical comorbidities and poor health outcomes are a result of drug side effects, such as secondary weight gain. [9,10]

patient's physical and mental health outcomes will be improved by adopting healthy lifestyle behaviors including quitting smoking, refraining from abusing drugs or alcohol, making wise dietary decisions, and engaging in more physical activity. The signs of a patient's improved recovery will therefore be taken into account by these alterations.

Operational definition

Lifestyle intervention in this study focused on good mental hygiene factors such as dietary habits, exercises, smoking habits, substance use, sedentary life, and stress reduction. In addition to other mental hygiene factors as building social relationships, fostering hope, and how to maintain medication compliance and prevent relapse.[12]

Aim of the study

To evaluate the effectiveness of lifestyle intervention on recovery of patients with bipolar disorders.

Research hypothesis

Lifestyle intervention is expected to improve recovery of patients with bipolar disorders.

Subjects and method

Research design

This study utilized a quasi-experimental design.

Setting

The inpatient psychiatric department of Tanta University. It has a capacity of 31 beds divided into two wards for male (17 beds) and two wards for female (14 beds) as well as Neurology, Psychiatry, and Neuro-Surgery Center. It has a capacity of 28 beds divided into one ward for male (18 beds) and one ward for female (10 beds). Both hospitals are under the supervision and direction of the ministry of higher education.

Subjects

The sample size calculation was done using EPi-Info software based on the following criteria: 95% confidence limit, 80% power of the study, ratio between treatment and control group of 1: 1 and expected level of recovery - of 30% before intervention that will be improved to 70% after --intervention. Based on the above-mentioned criteria, a convenient sample of 60 patients with bipolar disorders were allocated randomly by simple random sampling technique to experimental and control group (30 patients in each group).

The selected patients were chosen based on the following inclusion criteria

- Diagnosed with bipolar disorder according to DSM-5 criteria,
- During remission,
- Willing to participate in the study.

The exclusion criteria include:

-Current or past substance-use disorder,

- Neurological illness, acute medical illness, or mental retardation.

Tools of the study

Tool I: Socio-demographic and clinical characteristics

It was developed by the researchers after reviewing the related literature. Socio-demographic data includes patient's age, sex, level of education, occupation, marital status, and residence. Clinical characteristics include duration of illness and number of previous admission.

Tool II: Simple Lifestyle Indicator Questionnaire (SLIQ)

It was developed by **Godwin et al., (2008)** [25] and adopted in the current study. Five lifestyle factors that have been found to have an impact on physical health were measured. The SLIQ has 12 questions: three on diet, three on physical activity, three on alcohol consumption, two on smoking, and one on stress. A raw score and a category score can be computed for each component. The five category scores are used to calculate the overall SLIQ score, giving each component an equal amount of weight. Overall SLIQ scores can range from 0 to 10, with each component having a category score of 0, 1, or 2. A higher raw score denotes healthier behaviour for all dimensions except alcohol consumption.

According to the grading guide, the raw scores are transformed into category scores ranging from zero to two, with 0 signifying a subpar score in that dimension, one an average score, and two a healthy score. On a scale from 0 to 10, the category scores are added to get the total score, which is then divided into three categories: unhealthy (scoring 0-4), intermediate (score 5-7), and healthy (score 8–10).

Tool III Bipolar Recovery Questionnaire (BRQ)

The was developed by **Jackson (1967)** [26] and adopted in the existing study. It was used to evaluate individual experiences of bipolar disorder recovery and has 36 items. Each response is evaluated on a 100 mm visual analogue scale from 0 to 100, with the anchors "strongly disagree" (zero), "disagree" (twenty-five), "agree" (seventy-five), and "strongly agree" (one hundred) for affirmative responses, and the opposite for negative responses. The total BRQ score is determined by adding up the individual scores for each of the 12 reverse-scored items (strongly disagree = 100, strongly agree = 0).

- Less than 50% indicate poor self-related recovery.
- A score of 50-75 indicates fair self-related recovery.
- A score greater than 75% indicates high self-related recovery.

Procedure

- An official letter was addressed from the Dean of the Faculty of Nursing to the Director of the Psychiatric Department of Tanta University Hospital and Neuropsychiatry and Neurosurgery center to request their permission and cooperation for data collection.
- The researchers translated tools II and III into Arabic language then translating them back. Results indicated that the back translation and the original were comparable. A panel of five specialists in the disciplines of psychiatric medicine and nursing conducted a content validity assessment, and the necessary adjustments were made as a result.
- A pilot study was carried out on 10% of patients with bipolar disorder to ensure the

clarity and applicability of the study tools. These patients were excluded later from the actual study.

- The reliability of the validated tools was then evaluated using Cronbach's alpha, and it was determined to be reliable (0.841 & 0.869, respectively).
- The study was carried out in four stages: assessment, planning, implementation, and evaluation phase.

Assessment phase: It was done for both groups (experimental and control group) before implementing the lifestyle intervention using study tools as a pretest. The control and experimental group were assigned randomly by using concealed sealed envelopes. Once the patient has consented to enter the trial an envelope is opened to randomly assign patients to (experimental group 30 patients) or (control group 30 patients).

Planning phase

-This phase was formulated based on the assessment phase.

-The general and specific objectives of lifestyle intervention were formulated.

Objectives of lifestyle intervention:

At the end of the intervention the patients will be able to:

- Explain the different component of lifestyle intervention.
- Differentiate between physical and psychological elements.
- Follow steps that are necessary to practice this intervention.
- Apply what had been learned in the daily life.

-Content of the intervention was developed after a thorough review of the literature [16,26,27]. It included the necessary systematic skills that will be taught during the twelve sessions. Skills to be taught gradually moved from a simple and basic to a more complex one.

- The sessions were transcripted in Arabic language. Each session covered the following outline:

- Specific objectives of the session.
- Importance of the session.
- Examples from real life.
- The specific steps needed to learn the skill.
- Role play by the researcher and patients to practice the skill.

-The content of each session was revised and approved by all researchers after making sure of its applicability to the intended patients.

Implementation phase

-Patients in the experimental group were divided into 6 subgroups. Each subgroup ranged between 4 and 6 patients. Each subgroup attended twelve sessions, three sessions per week with a duration of 60 to 90 min.

-Before each session, the seats were arranged in circular shape and the researchers gathered the patients from their wards to a specific room in the hospital.

-The intervention sessions were conducted as a follow:

-**In the first session**, the researchers met the patients in a quiet room, greeted them, allowed the patients to take their seats and introduced themselves to the patients as well as each patient to the others. The researchers then provided detailed information in relation to:

a) Number of group members, place of meeting, duration of the intervention, frequency of meetings and length of each session.

b) Clarification of the specific goals of the intervention.

c) Grounded rules of the group e.g., confidentiality and honesty. What to expect in the group in terms of their own roles e.g., listen attentively to each other, there are no right or wrong answers, and everyone has an equal chance to participate.

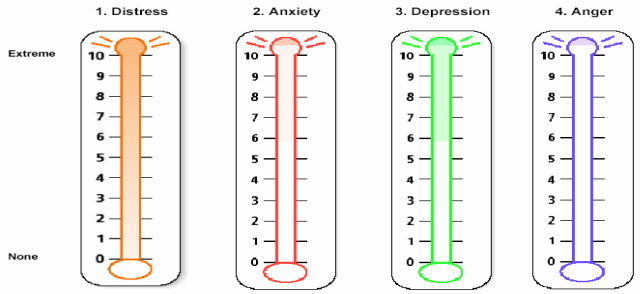
Second session: it includes giving information about bipolar disorders (definition, causes, types, symptoms, and treatment). In addition to relate all of this to each patients to help them identify their own conditions and realize that it may be different from other patients. Consequently, know how to deal with their situations effectively.

Third session: focused on helping patients to recognize early warning signs of relapse. This session is covered by three training exercises that help the patient to recognize his or her signs of relapse.

Exercise one: symptoms checklist (each patient is asked to select all the symptoms that happened before the relapse and all symptoms that happened at the beginning of relapse.

Exercise two: color cards (help patients to determine the most important and specific symptoms of his or her relapse: red cards include the symptoms that happened before relapse and the patient is asked to select the most annoying symptoms, while the blue cards include the symptoms that happened at the beginning of relapse and the patient is asked to select the most annoying symptoms.

Exercise three: by using emotion thermometer to determine how do he/she feel today? There are five thermometers listed from zero to ten, a thermometer one measures stress, thermometer two measure anxiety, thermometer three measure depression, thermometer four measure anger, and the last one measure the degree of help that were provided to yourself to get out of this bad mood. The patients were asked to put a mark on the degree he feels in each thermometer, and by the way, it may be only one feeling that he felt it today and it is not necessary to have all these feelings in one day.



Fourth session: centered around medication compliance and involves instruction about the meaning of compliance, importance of it, causes that lead to noncompliance and effective strategies to increase compliance with medication. The session also included a part about common side effects of drugs that may be a factor of noncompliance and how to deal with these side effects.

Fifth session: focused on a healthy diet. Definition of healthy food and its importance, healthy eating habits, nutrition pyramids. Additionally, the session contained a segment about unhealthy food and its risks. Also, the association between bad dietary habits and mental health problems was elaborated. Measuring the body mass index for each patient to determine whose weight was above or below or within normal range then teach patients how to make a balanced diet.

Sixth session: centered on physical exercise. Physical and psychological benefits of exercise were illustrated. In cooperation with physical education coach an optimal program for patients were developed with

specific guidelines to help patients how and when practice physical exercise regularly. Moreover, time allotted during session to practice physical exercise with all patients to increase their motivation and enhance patients' participation and practice.

Seventh and eighth session: the main core of these sessions is how to cope with stress and teach about stress management techniques. The sessions initiated with an introduction about stress and its effect on physical and psychological health, stress triggers, and the relationship between stress exposure and exacerbation of symptoms of bipolar disorders. Additionally, the intervention included how to maintain healthy ways to cope with stress, how to deal effectively with triggers of stress and helping patients to start a regular habit of relaxation strategies and meditation to manage stress. Different videos that show how to practice stress management techniques were introduced to the patients followed by modeling by the researchers and practicing role plays by the patients during the sessions to learn different relaxation techniques.

Ninth session: targeted smoking and substance abuse. The relationship between abuse and symptoms of mental illness were illustrated. In addition to, the adverse effects of abuse/smoking, triggers of substance abuse and smoking, and benefits of quitting both of them were illuminated. Furthermore, some suggestions about how to cope with cravings and how to stop smoking/substance abuse were demonstrated. Also, during the session the association between increased level of stress, smoking\substance abuse and increase symptoms of illness were shown and effective ways to overcome all of this. (refer to the previous session)

Tenth session: addressed fostering hope. The session aimed to teach the patients about the meaning of hope, its importance in the recovery process and how to practice hopeful views in daily life. As well, the relationship between positive\hopeful thinking and enhancement of psychological wellbeing were presented. Asking the patients to give real examples about people with hopeful thinking is encouraged to be role models for them. Moreover, the researchers encouraged the patients to remember certain situations in their life in which they practice hopeful thinking and its effect on the outcomes of the situations.

Eleventh session: focused on building social relationships. The aim of this session was to help patients to recognize the benefits of healthy social relationships and their effects on the recovery process. How to maintain healthy relationships and give them some tips to improve social competence to build and nurture social relationships with others. In addition, the patients were encouraged to give real examples from their own life about supported relationships and how it affects their quality of life as a whole. To increase effectiveness of this session, the researchers start to demonstrate how to initiate and maintain relationships with others. Then, role plays were done by all patients to master this skills. Positive and corrective feedback was given to the patients to enhance their performance.

Twelfth session: the last session centered on recovery. The meaning of mental health recovery, essential elements of it and specific steps that are applied by some other patients and found to be successful with them were recommended to follow it to move towards recovery. Moreover,

obstacles to recovery were also discussed and effective measures to deal with these difficulties.

-Throughout the training intervention, the researchers used brainstorming to encourage wide and creative thinking about the topic of the sessions. This was done through stating a problem to the group, listening to their ideas, and recording it on the whiteboard. When all ideas were listed, the researcher allowed the patients to discuss the responses with each other. Also, the researchers gave examples from the patients' daily life and from their own experience to encourage patients to participate during the sessions.

-At the end of each session, the researcher made a summary of what has been going on.

-At the end of the whole intervention a closing session was done to get the patients' feedback and opinions about the intervention and the benefits they gained from it. In addition to their recommendations for further improvement.

-The educational strategies that have been used in the training program were

- Brain storming
- Group discussion
- Role play

-In order to ensure that the control group will not be affected by the learned skills taught to the study group, the researcher had to wait to finish the whole intervention and start the process of surveying patients for recruitment of the control group, making sure to consider appropriate matching in relation to age, education, duration of illness, and numbers of hospitalization. Study tools were applied on those patients as a pre-test.

Evaluation phase

- Immediately at the end of the intervention and after 3 months, posttest was done for the experimental group using the study tools on each patient on an individual basis.

-As for the control group a post test was done after a matched number of days compared to the study group.

-According to the baseline scores on the study tools, comparison was done between pre and posttests in both the experimental and control groups.

Ethical consideration

-Study procedure was revised and approved by the Ethical Committee of the Faculty of Nursing code 195-1-2023.

-Written consent was obtained from both study subjects after explanation of the study purpose.

-Privacy and confidentiality were assured to all study subjects.

-Both study subjects had the right to quit this study at any time and this should be respected and assured.

Statistical analysis

The data normality was assessed using the Kolmogorov-Smirnov test. The range, mean, and standard deviations for numerical values were computed. The student's t test was performed to compare the differences between two mean values. Analysis of variance ANOVA (F) was used to test whether there were any differences in mean values between more than two groups. When the normal distribution of the data could not be confirmed, Mann-Whitney analysis was utilized. For categorical variables, the number and percentage were determined, Chi square and Fisher Exact tests were used to determine whether there were any differences between

subcategories. At p .05. statistical analyses were deemed significant.

Results

Table (1) presents the distribution of the studied patients according to their sociodemographic and clinical characteristics. In relation to age, the mean age was 30.20 ± 7.49 years for study group and 30.53 ± 7.23 for control group with the highest percent being in the age group ranging from 20 to less than 30 years.

Concerning sex, study and control groups had equal percent for both male and female 46.7 & 53.3 respectively. In relation to residence, study and control groups also had the same percentage for rural and urban area (60 % &40% respectively for both groups).

As for marital status, around half of the studied subjects were married represented by 56.7% for control group and 50 % for study group. Regarding educational level, more than half had primary and preparatory level of education (60 % control & 53.3% study). As regards occupation, around two thirds of subjects were not working with a percent 70% for study group and 66.7% for control group.

Speaking about number of previous admissions, more than half of the studied subjects were admitted to the hospital one or two times as shown by 60% for study group and 53.3% for control group.

Comparing the experimental and control groups, no statistical significant difference was found in relation to all sociodemographic and clinical data using Pearson Chi-Square Test and Fisher's Exact Test. The absence of any statistical significant difference between the studied groups can reflect that both groups are matched.

Table (2) presents the comparison of the total lifestyle among experimental and control group throughout phases of the intervention. The table shows that the mean score of lifestyle among the study group increased after implementing the training program. In this respect, the mean score was 4.5 ± 2.8 before conducting the training program and increased to 7.1 ± 2.87 after terminating the program. This increment was statistically significant (P = 0.001*). Additionally, the mean score of lifestyle among the study group increased at the follow up. The mean score was 4.5 ± 2.8 before the program and increased to 6.3 ± 3.0 after three months from the implementation of the program with statistical significant difference (P = 0.003*). On the other hand, there was an increase in the mean score of lifestyle among the control group on the post-intervention compared to the prior figure (3.89 ± 2.4 before & 4.6 ± 2.9 immediately after). But without any statistical significant difference (P = 0.139). Moreover, there is no statistical significant difference between the lifestyle score before intervention and after three months at follow up (3.89 ± 2.4 before & 4.03 ± 2.5 at follow up) (P = 0.093). Comparing the mean differences in both the study and control groups at pre and post intervention (2.6 ± 1.85 & 0.71 ± 0.96 for study and control group respectively) a statistical significant difference was found between both of them (Z_{MW} = 3.024, P = 0.025*). Furthermore, when comparing the mean differences at pre and follow up for both groups (1.8 ± 1.31 study group & 0.14 ± 0.54 for control) also a statistical significant difference was detected (Z_{MW} = 2.349, P=0.041*).

Table (3) shows the comparison of the total recovery among experimental and control group throughout phases of the intervention.

The table shows that the mean score of recovery among the study group increased after implementing the training program. In this regard, the mean score was 67.23 ± 25.10 before conducting the training program and increased to 104.3 ± 31.67 after terminating the program. This increase was statistically significant (P = 0.001*). Additionally, the mean score of recovery among the study group increased at the follow up. The mean score was 67.23 ± 25.10 before the program and increased to 97.70 ± 24.20 after three months from the implementation of the program with statistical significant difference (P = 0.003*). On the other hand, there was an increase in the mean score of lifestyle among the control group on the post-intervention compared to the prior figure (58.33 ± 18.01before & 74.0 ± 28.45 immediately after). But without any statistical significant difference (P = 0.139). Moreover, there is no statistical significant difference between recovery score before intervention and after three months at follow up (58.33 ± 18.01before & 73.40 ± 28.42 at follow up) (P = 0.093). Comparing the mean differences in both the study and control groups at pre and post intervention (37.07 ± 18.54& 15.67 ± 12.52 for study and control group respectively) a statistical significant difference was found between both of them (Z_{MW} = 8.521, P = 0.001*). Furthermore, when comparing the mean differences at pre and follow up for both groups (30.47 ± 17.32 study group & 15.07 ± 12.08 for control) also a statistical significant difference was detected (Z_{MW} = 3.754, P=0.012*)

Table (1) Distribution of the studied patients regarding their sociodemographic and clinical data

Sociodemographic and clinical data		Experimental		Control		X^2	P-value
		N	%	N	%		
Age	20 – 30	18	60	17	56.7	X^2= 0.081	0.960
	31 – 40	9	30	10	33.3		
	> 40	3	10	3	10		
	Range	20 – 48		22 – 48		T: 0.175	0.861
	Mean ± SD	30.20 ± 7.49		30.53 ± 7.23			
Sex	Male	14	46.7	14	46.7	X^2= 0.0	1.0
	Female	16	53.3	16	53.3		
Residence	Rural	18	60.0	18	60.0	X^2= 0.0	1.0
	Urban	12	40.0	12	40.0		
Education	Illiterate	9	30.0	9	30.0	F^{ET}= 2.118	0.548
	Primary /preparatory	16	53.3	18	60.0		
	Secondary	3	10.0	3	10.0		
	University	2	6.7	0	0.0		
Occupation	Not worked	21	70.0	20	66.7	F^{ET}= 0.101	0.951
	Craft man	6	20.0	7	23.3		
	Professional business	3	10.0	3	10.0		
Marital status	Single	9	30.0	9	30.0	F^{ET}= 0.525	0.769
	Married	15	50.0	17	56.7		
	Divorced	6	20.0	4	13.3		
Duration of illness (years)	1 – 4	16	53.3	17	56.7	F^{ET}= 0.230	0.891
	5 – 10	11	36.7	11	36.7		
	11 – 15	3	10	2	6.7		
	Range	1 – 15		1 – 15		T: 0.490	0.626
	Mean ± SD	5.87 ± 4.28		5.37 ± 3.60			
No of previous admission	1 – 2	18	60	16	53.3	X^2= 0.403	0.817
	3 – 4	6	20	8	26.7		
	5 – 7	6	20	6	20		
	Range	1 – 7		1 – 7		T: 0.271	0.787
	Mean ± SD	2.80 ± 1.92		2.93 ± 1.89			

F^{ET}= Fisher's exact test T= student t- test X^2= Chi-square test *Significant at level P≤0.05

Table (2) comparison of total lifestyle among experimental and control group throughout phases of the intervention.

Total lifestyle		Experimental	Control	Test of significance	
Pre-intervention	**Range**	1 – 10	1 – 10	T= 1.086	
	Mean ± SD	4.5 ± 2.8	3.89 ± 2.4	P= 0.282	
Immediately post	**Range**	2 – 10	2 – 10	T= 3.411	
	Mean ± SD	7.1 ± 2.87	4.6 ± 2.9	P= 0.001*	
Follow up. After 3 months	**Range**	1 – 10	1 – 10	T= 3.199 P= 0.002*	
	Mean ± SD	6.3 ± 3.0	4.03 ± 2.5		
Test of significance		^{F} P1 = 0.001* ^{F} P2= 0.003* ^{F} P3= 0.874	^{F} P1 = 0.139 ^{F} P1 = 0.093 ^{F} P1 = 0.943		
Mean difference					
Pre-post intervention		2.6 ± 1.85	0.71 ± 0.96	Z_{MW} = 3.024	P=0.025*
Pre- follow up		1.8 ± 1.31	0.14 ± 0.54	Z_{MW} = 2.349	P= 0.041*

Z_{MW} Mann-Whitney test **T:** student t- test **F:** ANOVA test

*****Significant at level p≤0.05

P1= comparison between pre and immediately post intervention

P2= comparison between pre intervention and follow up

P3= comparison between immediately post intervention & follow up

Table (3) comparison of total recovery among experimental and control group throughout phases of the intervention.

The Bipolar Recovery Questionnaire		Experimental	Control	Test of significance
Pre-intervention	**Range**	43 – 125	42 – 120	T= 1.578 P= 0.120
	Mean ± SD	67.23 ± 25.10	58.33 ± 18.01	
Immediately post	**Range**	53 – 139	44 – 136	T= 3.898 P= 0.001*
	Mean ± SD	104.3 ± 31.67	74.0 ± 28.45	
Follow up. After 3 months	**Range**	58 – 135	44 – 136	T= 3.566 P= 0.001*
	Mean ± SD	97.70 ± 24.20	73.40 ± 28.42	
Test of significance		^{F} P1= 0.001*	^{F} P= 0.139	
		^{F} P2= 0.003*	^{F} P= 0.093	
		^{F} P3= 0.874	^{F} P= 0.943	
Mean difference				
Pre – post intervention		37.07 ± 18.54	15.67 ± 12.52	Z_{MW} = 8.521 P= 0.001*
Pre – follow up		30.47 ± 17.32	15.07 ± 12.08	Z_{MW} = 3.754 P=0.012*

Z_{MW} :Mann-Whitney test **T:** student t- test **F:** ANOVA test

*****Significant at level p≤0.05

P1= comparison between pre and immediately post intervention

P2= comparison between pre intervention and follow up

P3= comparison between immediately post intervention & follow up

Table (4) comparison of lifestyle subscales among experimental and control group throughout phases of the intervention.

Diet		Experimental	Control	t. test	p. value
Pre intervention	Range	0 – 7	1 – 9	2.011	0.065
	Mean ± SD	3.37 ± 1.92	4.67 ± 1.94		
Immediately post	Range	10 – 15	1 – 9	15.001	0.001*
	Mean ± SD	12.40 ± 1.50	6.07 ± 1.76		
Follow up	Range	8 – 13	3 – 8	13.326	0.001*
	Mean ± SD	10.10 ± 1.27	5.53 ± 1.38		

Continue table (4)

Activity scale		Experimental	Control	t. test	p. value
Pre intervention	Range	0 – 16	0 – 16	0.945	0.348
	Mean ± SD	4.67 ± 5.54	3.47 ± 4.20		
Immediately post	Range	17 – 37	0 – 19	13.585	0.001*
	Mean ± SD	25.50 ± 5.12	7.00 ± 5.42		
Follow up	Range	7 – 31	0 – 14	8.952	0.001*
	Mean ± SD	16.13 ± 5.58	4.53 ± 4.39		

Continue table (4)

Substance		Experimental	Control	t. test	p. value
Pre intervention	Range	0 – 2	0 – 2	0.348	0.729
	Mean ± SD	1.33 ± 0.76	1.40 ± 0.72		
Immediately post	Range	2 – 2	1 – 2	2.112	0.039*
	Mean ± SD	2.00 ± 0.00	1.87 ± 0.35		
Follow up	Range	1 – 2	0 – 2	1.537	0.130
	Mean ± SD	1.77 ± 0.43	1.57 ± 0.57		

Continue table (4)

Stress		Experimental	Control	t. test	p. value
Pre intervention	Range	1 – 3	1 – 2	0.479	0.634
	Mean ± SD	1.50 ± 0.57	1.43 ± 0.50		
Immediately post	Range	4 – 6	1 – 3	17.914	0.001*
	Mean ± SD	4.60 ± 0.62	1.60 ± 0.67		
Follow up	Range	3 – 5	1 – 3	13.981	0.001*
	Mean ± SD	3.77 ± 0.68	1.50 ± 0.57		

Continue table (4)

Smoking		Study		Control		X^2	P-value
		N	%	N	%		
Pre intervention	**Yes**	14	46.7	13	43.3	X^2= 0.069	0.795
	No	16	53.3	17	56.7		
Immediately post	**Yes**	12	40.0	13	43.3	X^2= 0.073	0.793
	No	18	60.0	17	56.7		
Follow up	**Yes**	10	33.3	13	43.3	X^2= 0.632	0.426
	No	20	66.7	17	56.7		

Discussion

The enhancement of patients' lifestyle activities can be correlated with a decline in morbidity and mortality rate and a significant improvement in quality of life in the long-term [27,28]. Numerous helpful interventions, including nutritional and daily life components, have been developed in the past decades, with the intention to alter patients' lifestyle activities [29, 30]. Nonetheless, the evidence to confirm the effectiveness of lifestyle interventions is still limited [31]. Some studies reported significant benefits while others failed to demonstrate that [32]. Moreover, personal recovery has been the focus recently, rather than drug therapy in the management of serious mental disorders. Considering their well-being and quality of life[33] .

Hence, based on this new focus and the inconsistency in the findings, the current study aimed to assess the effect of lifestyle intervention on recovery of patients with bipolar disorders.

The present study findings support the study hypothesis and demonstrate a significant effect of lifestyle intervention on total lifestyle activities and almost all its subscales (namely activity level, diet, stress response and substance use). This significant improvement may be attributed to the content of the intervention. Regarding diet, the patients received a lot of information about the importance of a healthy diet, its components, and different examples about sources of healthy food. In this respect, there are conclusions in the literature that healthy promotion interventions involving healthful nutrition enhanced the quality of life as well as weight loss in individuals with BD [28,34]

In relation to activity, the significance of regular exercise was introduced to the patients and its role in preventing various physical illness. In addition to practicing physical exercise during the session with guidance from a physical education coach to develop an optimal program for patients with bipolar disorder. In this regard, Jackson et al., (2015) reported that it is important that the physical health of people with bipolar disorder be taken into consideration in the treatments by the clinicians. This action can reduce their risk of developing physical health problems in later life (26). Moreover, De Hert et al., (2022) found that lack of physical activity is one factor of the unhealthy lifestyle behaviors that increase risks of developing metabolic syndrome among patients with bipolar disorders compared to the general population[35]

As for stress response, the patients have learned during the intervention how to cope effectively with stress, types of stress, its manifestation, and harmful effect of stress on patients' health. Also, the patients were informed about the association between frequent exposure to stressful situations and the occurrence and exacerbation of symptoms of the disorders. In the same respect, the National Institute of Clinical Excellence (NICE, 2016) reported that the high rate of relapse and reported experienced residual symptoms by many patients with bipolar disorders implies that there is a gap in the present treatment. Recommends another approach involving stress management as a relapse prevention approach for those patients[36] .

As regards substance use, the destructive effects of substance use were illustrated to the patients and the association between abuse and exacerbation of disease symptoms.

Furthermore, different examples about aggravating factors to substance use and how to deal effectively with these situations were also handled during intervention sessions. Along the same line, the literature indicated that patients with bipolar disorders recurrently adopt unhealthy lifestyle behaviors, as lack of physical activity, unhealthy diet, heavy smoking and use of alcohol or illicit substances and this style could contribute to poor physical health [37-39] .

Another important factor that might explain the findings of the present study is that the intervention sessions attempted to combat the effect of sedentary life that are appealing on the patients and had a detrimental effect on their wellbeing. Factually, the status of the subjects in the existing study is being hospitalized, have limited activity level, monotonous and repeated routine and the scarce of leisure time activities. All these factors imposed on them due to the closed environment in the hospital with its negative consequences.This deskbound regimen makes the patients in need of any innovations and changes in their daily routine. In this respect, Lee (2012) reported that physical inactivity increases the risk of many adverse health conditions and is a significant cause of premature mortality [40]. On the other hand, Schuch (2018) informed that being physically active has the potential to protect against depression [41].

Furthermore, the researchers in the current intervention make all efforts to overcome several barriers that affect patients' readiness to modify daily activity such as low levels of motivation, lack of knowledge, and inexperience/lack of competence. The researchers frequently encourage the patients to participate actively in all activities carried out in the sessions, giving them more than one chance to practice with the presence of group climate characterized by trust, security, and sense of belonging. These therapeutic elements create a peaceful environment in which patients feel open, relaxed and willing to do anything within the group. Firth (2016) & Schuch (2016) found that the presence of good social and peer support networks and the recognition of the psychological and physical benefits of lifestyle intervention is among the aspects that help facilitate its conduction [42,43].

Additional factor is documented and may play a role in the justification of the current results which is the effect of group on the patients' behaviors. It is well known that the experience within the group has many benefits for the participants as it creates a feeling of friendship, mutual support, acceptance, and decreases feeling of alienation. Additionally, the participants within the group feel easy to expose themselves and discuss their experiences with colleagues without hesitation or suspiciousness. Moreover, feeling of hope and optimism in the recovery can be enhanced which makes the patients feel enthusiastic to practice in the group. These benefits might explain the significant improvement in patients' lifestyle [44] .

Dor et al. (2019) stated that the group is not only a cost-effective method of remedying many patients concurrently; but it is a necessary component to facilitate the recovery process [45]. Mashinter (2020) added the recognition that the patient is not alone is the power of group therapy. Furthermore, the acknowledgement that other people have similar conditions is one of the first steps to feeling healthy again. Moreover, group work provides meaningful connections with others in similar situations, so clients can support each other [46].

The only subscale that is not affected and not improved after lifestyle intervention is smoking. Factually, smoking can be a very difficult and destructive habit for patients, and it is very hard to control it. Additionally, the patients may resort to use smoking as a way to deal with different stressors they face on a daily basis and might be used as a self-medication strategy to overcome symptoms of mental illness. Along the same line, John et al., (2004) & Zammit et al., (2003) documented that smoking can be utilized as a self-medication coping strategy to alleviate cognitive deficits, minimize medication side effects, improve attention and concentration and relieve depressive and anxiety symptoms[47,48].

The present study findings go in the same line with the findings of Väänänen et al., (2020) who reported that lifestyle interventions improved depressive symptoms, weight, physical activity, and serum lipids in individuals with bipolar disorders [49]. Furthermore, Ashton et al., (2020) found that individuals with a diagnosis of bipolar disorders who participated in physical activity reported less depression and better quality of life. In addition, earlier randomized controlled trials found that leisure-time physical activity could reduce depression, anxiety, and insomnia symptoms [44, 50]

Speaking of the second main finding of the present study which is the significant effect of lifestyle intervention on recovery of patients with bipolar disorders. This result could be attributed to the enhancement of lifestyle and its domains. Empirically, when the patients gained improvement in their daily routines and activities and acquired healthy habits and applied it in their life this consequently equipped them with the necessary elements for recovery. In addition, help them to live their life with optimum functioning and decreases tremendous effects of chronic illness. Furthermore, during the intervention the patients learn hopeful and optimistic thinking and tried to apply it within the session as well as learned how to create social networks which support and help them to deal with their illness. These components foster patients' recovery and promote wellbeing.

These findings are in line with a recovery approach which claims that treatments should focus on supporting people with bipolar disorder to live meaningful lives despite the challenges they face, rather than simply eliminating the symptoms of bipolar disorder. Consequently, these steps may have a large effect on clinical outcomes and the quality of life of adults with bipolar disorder [51].

Similarly, Slade et al., (2014) differentiate between the concept of personal recovery which means living a satisfying, optimistic, and beneficial life even with restrictions caused by the illness and the clinical recovery that focuses on continued remission and rebuilding of functioning and does not change across patients with mental illness [52] .

Another important factor that may explain the improvement in recovery is the effect of intervention atmosphere on the patients. More specifically, during conduction of the sessions the researchers tried to create home like environment to promote feeling of independence, socialization, and gain mastery of environment. Moreover, the intervention involved a separate session about recovery and how to achieve it. Additionally, during the intervention the patients had been learned how to comply with their medications and how to recognize early signs of relapse. Both of them have a positive effect on recovery and decrease the burden of the illness on the

patients and their families. This explanation goes in the same line with Iseselo & Ambikile (2020) they found that when patients' adherence to psychotropic medication is good, symptoms of mental illness are reduced, and social participation or involvement in different activities is improved [(53)]. These deliberations are important to boost recovery and reintegration in the community after discharge from hospital. This justification is goes in agreement with the factors that facilitate recovery from a mental illness as the presence of independent lifestyle, patient participation in daily activities, and self-care [(54,55)].

The results of the present study go in accordance with other results reported that occupying a person with mental illness in daily activities plays a key role in the measurement of functional health which is the component of the recovery process. A systematic review has shown that regular physical activity is widely recognized as a protective factor against the overall burden of disease and hence promotes recovery from mental illness [(55)]. On the contrary to our study results, Reynolds (2020) & Speyer et al., (2016) reported that they did not found any effect of lifestyle intervention[(56.,57).]

Conclusion

Based on the results of the present study it can be concluded that lifestyle intervention promote recovery and enhance daily life activities in patients with bipolar disorders except smoking habit needs more effort and variety of interventions to eliminate it.

Recommendations

-Different interventions directed to modifying lifestyle activities need to be planned and implemented for patients with bipolar disorders to improve their mental well-being and enhance their recovery.

-Sedentary lifestyle that takes place in the hospital need to be changed and substituted with more energetic regimen to increase patients' activity level and decrease possible negative consequences of inactivity.

-Recovery from mental illness ought to be the first and highest priority therefore, the implemented hospital routine should involve a variety of interventions directed to enhance patients' recovery such as physical activity program.

-Advanced intervention needs to be thought of and applied to patients with bipolar disorders to help in decreasing smoking habits and eliminate its negative effects.

-Future research should be done to investigate the potentially modifiable factors that might be beneficial in reducing the rate and frequency of smoking among patients.

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