Effectiveness of Cognitive Behavioral Therapy Intervention on Depressive Symptoms and Sleep Quality among Postnatal Women

Hemat Mostafa Amer[1, a], Hanady Sh. Shehata[1, b], Faten Hasan Alam[2], Rasha Kamal Mohamed Sweelam[3], Mervat Mostafa Arrab[4]

[1, a, b] Assist Professor of Family and Community Health Nursing, Faculty of Nursing, Menoufia University, Egypt

[2] Assist Professor of Psychiatric and Mental Health Nursing, Faculty of Nursing, Menoufia University, Egypt

[3] lecturer of Psychiatric and Mental Health Nursing, Faculty of Nursing, Menoufia University, Egypt

[4] Assist Professor of Family and Community Health Nursing, Faculty of Nursing, Menoufia University, Egypt and Assist Professor of Nursing Department, College of Nursing, King Khalid University, Khamis Mushait, KSA.

Abstract:

Background: Postpartum period is associated with emotional disturbances with the tendency occurrence of post-partum depression and change in sleep quality. Cognitive behavioral therapy has been suggested as the primary line treatment for managing postnatal depression and it is also successful in dealing with post partum sleep problems. **Aim**: to investigate the effectiveness of cognitive behavioral therapy intervention on depressive symptoms and sleep quality among postnatal women. **Design:** A quasi-experimental design was utilized. **Setting**: The study was conducted at three Maternal and Child Health Centers; three from ten health centers were selected by multistage random selection included; Shebin El-Kom (two centers) and Tala (one center) districts affiliated to Menoufia governorate, Egypt. **Subjects**: A purposive sample of 260 postpartum women selected from previous chosen settings. **Instruments**: three instruments were utilized included: An interviewing questionnaire contained; socio-demographic characteristics and current obstetric history of the studied women, The Edinburgh Postnatal Depression Scale and Sleep Quality Scale. **Results:** 81.5% of studied women suffer from possible depressive symptoms (risk for depression) in pre intervention, decreased to 53.5% in post intervention with statistical significance differences between pre and post intervention p =.000. Furthermore, there were statistical significance improvements in the levels of sleep quality among studied women p =.000 as evidenced by, 23.1% of studied women with severe sleep problem in pre intervention, decreased to 8.4% in post intervention as a consequence of intervention; 35.7% of studied women with mild sleep problem in pre intervention improved to 51.2% in post intervention. In addition, there was negative correlation between total score of depressive symptoms and sleep quality after cognitive behavioral therapy intervention**. Conclusion:** Cognitive behavioral therapy was an effective maneuver in reducing the symptoms of postpartum depression and improves sleep quality in postnatal women. **Recommendation:** Health education intervention based on preventive CBT should be provided to postnatal women to deal effectively with changes in sleep quality and manage depressive symptoms associated with postpartum period.

Keywords: Cognitive behavioral therapy, Depressive symptoms, Post natal women and Sleep quality.

Introduction

The postpartum phase is a time when a new family member joins the fold and a new order emerges. During this time, the woman adjusts to her new status as a mother, as well as to changes in her body image. Furthermore, the women may experience a variety of physical and psychological issues, including breast troubles, infection, insomnia, exhaustion, stress, hemorrhoids, and a sense of insufficient care for the newborn, inconsistency, and post-partum depression. As a result, all of these postpartum

issues could have a major impact on the women's quality of life **(Wang & Li, 2021).**

Post Partum Depression (PPD) affects 13-40% of women; British Journal of Psychiatry in 2017 reports that, women from underdeveloped nations reporting higher rates of PPD than women from developed ones (**Abdel Aziz & Abdel Halim, 2020).** Patients with postpartum depression have no previous mental illness but develop psychiatric disorder after childbirth, which have been primarily manifested as short-term and mild mood disturbances, such as restlessness, crying, depression, and other emotions, and they are irritable, depressed, easily anxious, fearful and they worry exceedingly about themselves and their infants. They frequently lose their ability to care for their infants as well as for themselves, and they may get lethargic and confused, having adverse consequences for the parturient, family members, and newborns **(Wang & Li, 2021).**

Sleep disturbances were experienced by approximately 30% of postpartum mothers after the birth of their newborn, with frequent nighttime awakenings and shorter total sleep time during the first 2 to 4 weeks postpartum (i.e., less than six hours). Postpartum nighttime infant care (i.e., nighttime feeding and care), bed sharing/sleeping with the infant, and other factors that reduce/disrupt sleep possibilities all have an influence on the effectiveness of sleep experienced by new mothers throughout the postpartum period **(Gueron- Sela et al., 2021).**

Insomnia or poor sleep and depression in postnatal women are frequently influenced by one another, and this joint influence may raise the risk for suicide **(Feng et al., 2020).** According to a recent study, sleep disorders are linked to severe depression, suicidality, and poor treatment outcomes for depression. Additionally, up to 80% of people with Major Depressive Disorder (MDD) have sleeplessness symptoms. Depression and insomnia have a bidirectional link, despite the fact that the underlying pathophysiology of this relationship is unknown. As a result, the intensity of depression is linked to the severity of insomnia, and the presence of one disorder is a risk factor for the development of the other (Tikotzky, 2019).

Cognitive Behavioral therapy (CBT) is a collaborative psychological technique based on investigational and scientific psychology **(Borza, 2017)** and beck proposed it for the first time in 1964 **(Li et al., 2020).** The CBT intervention is a patient-centered, individualized therapy administered by psychologists or psychiatrists. The therapy's contents vary, but they mainly consist of cognitive restructuring, psychological education, and behavioral management **(Alam, Shehata & Hassan, 2020).**

Cognitive behavioral therapy intervention main goal is to help patients better understand their own unique beliefs and behavioral patterns, as well as to find a better approach to transform their dysfunctional thinking, resulting in emotional and behavioral changes and the regulation of psychological and emotional disorders. CBT has been widely used for psychiatric problems due to its characteristics of "construction, short range, and concentrate on the present." The effect on depression has been documented in several prior research **(Lowndes, Egan, & McEvoy, 2018)**, anxiety (**Loughnan et al., 2018),** disturbed sleep (**Jessica & Rachel, 2021**) and other chronic medical conditions in recent years (**Picariello et al., 2018).**

The nurse plays a significant role in postpartum women's early intervention, such as establishing a healthy nurse–patient connection and providing information and ways to promote mother and newborn sleep. Meanwhile, postpartum women's mentalities, families, and social backgrounds were studied in order to provide targeted mental health education, settle postpartum anxiety, and provide adequate emotional support **(Missler et al., 2020).**

Furthermore, nurses take part in reducing sleep disturbances and depression symptoms, as well as developing an informative treatment program for postpartum women. The nurse encourages postpartum women to practice cognitive stress management training to help them identify factors that affect sleep patterns and depressive symptoms, as well as gain

insight into how to replace rational thoughts with incompetent and unreasoning ones **(Chamangasht, Akbari Kamrani & Farid, 2021).**

Significance of the study

Postpartum women frequently experience sleep problems and depression. PPD in the first year after childbirth is a prevalent problem in maternal mental health and has been dubbed "the thief that steals parenthood". In Egypt, PPD was found in 33.5 percent of mothers who visited three primary health care centers for immunization of their babies between January 2019 and January 2020 **(Ahmed et al., 2021),** and the prevalence of PPD is 21 percent in Lebanon, 22 percent in the United Arab Emirates (UAE), 19.2 percent in Tunisia, 22 percent in Jordan, and 37.1 percent in Bahrain **(Abd Elaziz & Abdel Halim, 2020).**

Postpartum depression increases maternal mortality by interfering with the demands of the mother **(MacKinnon et al., 2021).** In addition, disturbed sleep quality is widespread among new mothers and has been linked to a number of adverse maternal and child outcomes. Depression can be aggravated by poor sleep quality and the difficulties that follow. As a result, a problem in the mother-child interaction, a lack of breastfeeding, and poor care severely impede the development of children and their future lives **(Quin et al., 2022).**

The CBT intervention assists postpartum women in monitoring depression symptoms, emotion management, problem solving, stress management, interpersonal communication and support, and encouraging women to engage in leisure activities and social participation and considered as appropriate interventions for insomnia and depressive symptoms. Furthermore, sleep management was offered **(Verma et al., 2021).** As a result, the current study was suggested to examine the effectiveness of cognitive behavioral therapy intervention on depressive symptoms and sleep quality among postnatal women.

Aim of the study

Investigate the effectiveness of cognitive behavioral therapy intervention on depressive symptoms and sleep quality among postnatal women.

Methodology

Research Hypotheses

H1- Women who will participate in the cognitive behavioral therapy intervention will have improved postnatal depressive symptoms in post intervention compared to pre intervention.

H2- Women who will participate in the cognitive behavioral therapy intervention will have improved sleep quality in post-intervention compared to in pre-test.

H3- There is statistical significance correlation between depressive symptoms and sleep quality among post natal women.

Operational definitions

Cognitive behavioral therapy intervention: is a treatment approach that helps to recognize negative or unhelpful thought and behavioral patterns. It has historically been used for psychological disorders yet is now being explored for a number of different problems including; depression and insomnia associated with postpartum period **(Gueron-Sela et al., 2021).**

Postpartum women are those mothers who have given birth through a period extend for about six weeks **(Kansky, 2016).**

Postpartum Depression symptoms are sadness emotions symptoms that happen after delivering a baby. Women with postpartum depression experience frequent crying, emotional lows and highs, fatigue, guilt, anxiety and may have problem in caring for baby **(Elshatarat et al., 2018).**

Sleep quality is a postnatal women sleep quality means a self satisfaction with all aspects of the sleep experience. Sleep quality has four criteria: sleep efficiency, sleep length, sleep length and awake up after the onset of sleep (Nelson, Davis & Corbett, 2022).

Design

A quasi-experimental design was utilized.

Setting:

The study was carried out in three Maternal Child Health Centers to cover the needed sample size, three from ten health centers were selected randomly included; Shebin El-Kom (two centers) and Tala (one center) districts affiliated to Menoufia governorate, Egypt. These institutions consisted of three floors. The structure of these health centers were designed to provide many

primary health care services including: e.g. medical services, immunizations and family planning services to a large population sector, thus having a high flow rate of post-partum women.

Assignment of study setting

Multistage random sample was used to select two out of ten districts of Menoufia Governorate (First stage sample), then out of each district, three MCHCs were selected by simple random sample (Second stage sample). Then the third stage included; two MCHCs chosen from Shebin El kom district to cover (168 women) and one center from Tala district to cover (92 women). This assignment was represented at the following figure:

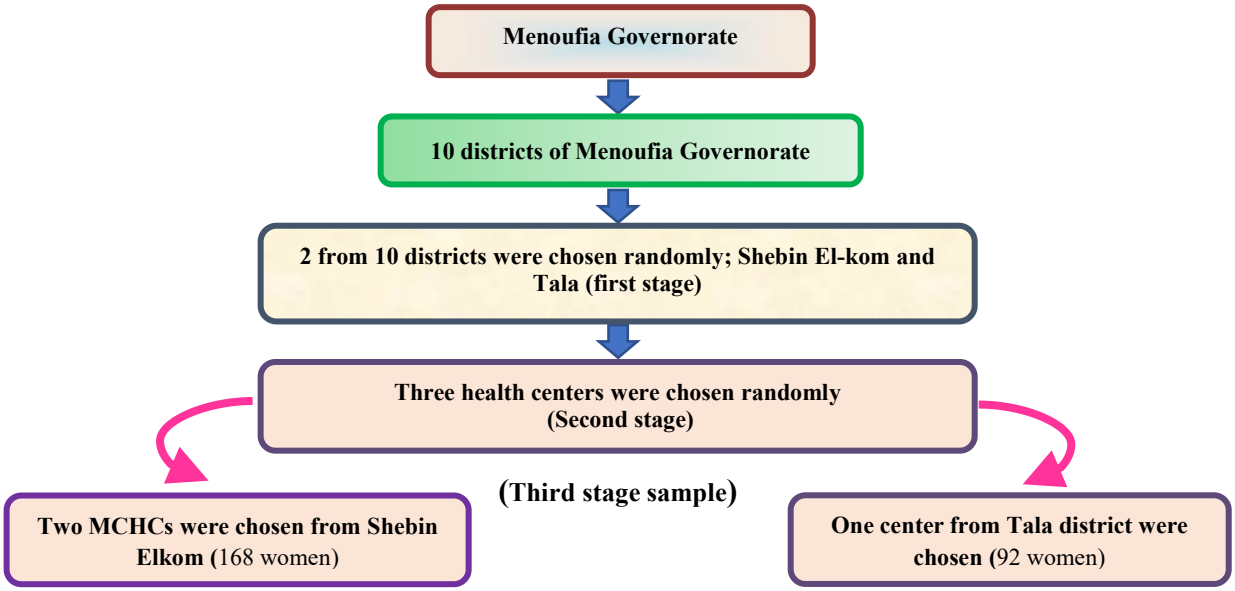

Fig (1): Method of implementation the multistage random sample in order to select the required sample size (260) studied post-partum women.

Sample

A purposive sample of 260 postpartum women who attended in the previous chosen Maternal and Child Health centers (MCHCs) for any reason and selected according to the following:

Inclusion criteria: -a) A postpartum women with a full term live birth baby and b) Accept to participate in the study.

Exclusion criteria: - a post partum women with previous history of mental disorder or currently use of prescribed psychiatric drugs

Sample size:

In order to calculate the sample size required to investigate the effectiveness of cognitive behavioral therapy on depressive symptoms and sleep quality among postnatal women. The sample size was calculated according to the following equation:

Sample size **n = [DEFF*Np (1-p)]/ [(d²/Z²$_{1-\alpha/2}$*(N-1) + p*(1-p)]**

n= Sample size
N **N**= population size = 750
P: hypothesized % frequency of outcome factor in the population 5 (from pilot study) = 13% +/-5
d:d Confidence limits as % of 100(absolute +/- %) = 5%
DEFF: design effect = 1

Z: probability when P is less than 0.05 = 1.96
α : alpha error = 0.05 (Confidence interval of 95% was used, with a sample size of 260 postpartum women.

Study instruments: three instruments were utilized to collect the needed data for this study:

I. An interviewing questionnaire: It was designed by the researchers in the Arabic language after reviewing the related literature and was divided into two parts.

a. Socio-demographic characteristics of the studied women included: age,level of education, religion, marital status, working status and socioeconomic status.

b. Current obstetric history of the studied women included: birth order, mode of deliver, gestational duration and occurrence of postpartum hemorrhage.

II. The Edinburgh Postnatal Depression Scale: developed by Cox & Sagovsky (1987) and reassessed by Bhusal et al., (2016) to identify possible symptoms of depression during the postnatal period. The scale consisted of 10 items and the response ranges from 0-3. The total score was 30; a score of 13 or higher is considered a red flag for the need for further evaluation of possible depressive symptoms (risk for PPD), and a score of less than 13 is considered stable or in the usual state (no signs of PPD).

III. Sleep Quality scale (SQS**):** developed by Yi et al., (2006), and used as a representative study by Howell et al., (2008). It evaluates six domains of sleep quality: daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction. SQS using a scoring of categorical scale. The studied women indicate how frequently they exhibit certain sleep behaviors in which (0 = “few,” 1 = “sometimes”,2 ="often,” and 3 = “almost always” .The SQS scale is consisting of 28 items. Scores on items belong to factors 2 and 5 (restoration after sleep and satisfaction with sleep) were reversed before being tallied. The total scores ranged from 0 to 84, with higher scores demoting more acute sleep problems. The scores of the scale were divided into three levels; mild sleep problem (0-28), moderate sleep problems (29-56) and severe sleep problem (57-84)".

Validity

Face and content validity of the developed instruments were examined by a peer review committee of five academic professors who are experts in family and community health nursing, psychiatric health nursing, psychiatric medicine to test the relevance and comprehensiveness of the instruments. According to the feedback of the peer reviewing committee, recommended modifications were carried out.

Reliability

The reliability was done to determine the internal consistency of study instruments by using Cronbach's Alpha r= 0.98. The Edinburgh Postnatal Depression Scale reliability was= 0.87 and the Sleep Quality Scale reliability was =0.92 and these results indicated the strong reliability of the study instruments.

Pilot Study

A pilot study was conducted to test the feasibility and the clarity of the scale items and to estimate the needed time to fill the questionnaire. A total of 10% of the recruited sample participated in the pilot study. The subjects who shared in the pilot study were not included in the actual study sample.

Ethical considerations & Consent:

An official approval was obtained from the Research and Ethics Committee of the Faculty of Nursing, an oral approval was obtained from the women after explaining the nature and the purpose of the study, The researchers explained to the women that participation in the study is voluntary and they

have the right to withdraw if they want, the confidentiality of the collected data was ensured.

Procedure

Data collection period started from the beginning of December, 2021 to the end of April, 2022. In the counseling room of family planning, at each MCHC, the researchers met the studied women. The researchers introduced themselves to all postpartum women who were attended to obtain the services of family planning and immunization of their children. Then, the researcher conducted an interview to collect baseline data, inform about the benefits of the CBT therapy, the group rules, and the timetable for meeting them once a time per week from 10 Am to 12 Pm until the end of the study for each group of MCHC. The availability of conducting home visit for women who didn't able to come to the MCHC based on agreed planned table for implementing the intervention and follow up at their home through the period of the study. The researchers were divided studied women into groups each group has 10 women and also divided them according to their MCHC in order to facilitate the implementation of the intervention

Posttest was taken one month later from last CBT intervention session. Throughout the study; the researcher follow up the studied women by telephone in order to assure on the intervention guidelines, to answer questions related to health status and emphasize the importance of attendance to the next session. The study was carried out on three phases:

Pre-test assessment phase: A comfortable, private counseling room of family planning was chosen for the pre-planned interview. All measures to prevent spread of infection were maintained according to World Health Organization, 2021 recommendation to control of infection. The researchers conducted individualized interviews with each s tudied women who gave their agreement to participate in the study to get a needed baseline assessment data (pre-test) using the study instruments. Pretest takes about one month to be collected. The average time taken for filling each questionnaire was about 30 to 45 minutes, according to the women's response.

Implementation Phase: (Cognitive behavior therapy intervention): The CBT intervention was conducted by the researcher. The general objective was to assist the postpartum women to live high quality life through; learn how to manage and overcome depressive symptoms, relaxation exercises and practices to improve mood and non-pharmacological techniques of sleep quality management. A set of specific objectives for each of the nine sessions were achieved through several teaching methods such as: lecture, brain storming, discussion, video, data show, role play and illustrative pictures. The researchers led the group and the co-leader recorded the sessions. The illustrated booklet of intervention was distributed on all participants of the study; conclusion, feedback and further clarification were done for a vague item. The studied women met for nine consecutive sessions according to each MCHC system of work; each session lasted approximately 2 hrs conducted as the following:-

- **The first session**: The aim of this session was to encourage women to participate actively in cognitive behavioral therapy. This is accomplished by acquainting the researchers with the women, outlining the group rules as confidentiality, as well as the planned time table for interviewing each group of intervention. Then the booklet was distributed to the women.

- **The second session**: This session covers the definition of the post-partum period, its length, post-partum changes and phases, the importance of adequate sleep, factors influencing sleep, symptoms of inadequate sleep, the relationship between cognition and sleep.
- **The third session**: This session contains, awareness about definition of depressive symptoms, factors contributing to it, identification of depressive symptoms and the relationship between cognition and depression.

- **The fourth session**: In this session, the

first step was described the relationship between thoughts, emotions and behaviors. Second, assist women in identifying negative irrational thinking and cognitive distortions by instructing them to stop at least five times per day and write down their thoughts and feelings. During this session, the researchers inspire the women to note those thoughts and argued with them to identify negative thoughts. Third, assist women in changing and replacing negative thoughts with positive and logical ones; teach them how to reframe negative thinking. For example, the women would say, "I've never done that before." The researcher would reframe that thought to, "It's an opportunity to learn something new."

- **The fifth session**: This session includes teaching the women the distinction between insomnia and sleep deprived symptoms, as well as how to manage sleep initiation and maintenance difficulties with stimulus management and time-in-bed limitation; also, education about typical sleep patterns of new parents to create realistic expectations about sleep was conducted.

- **The sixth session**: (relaxation). Every woman in the relaxation group was taught the relaxation method. Women were taught how to practice relaxation exercises during the first session, and the researchers performed the activities once. The women were requested to do activities in front of the researchers in the second session. Her performance was assessed, and the researcher corrected any technical issues. The women were then given relaxation CDs and told to do daily exercises at home and complete a relaxation exercise checklist before and after each session.

- **The seventh session**: This session was included applying problem-solving skills to cope with child care. First, a list of depressive symptoms was compiled, and then the problem was prioritized and characterized in terms of when it began and what caused it. Following that, many solutions were attempted via brainstorming. The effectiveness of the offered solutions was assessed at the start of the next session, and the researchers completed the problem-solving session checklist.

- **The eighth session:** This session focused on ways to alleviate or prevent postpartum depression, such as taking care of themselves, which is one of the best ways to improve women's health, mood and help them feel better again. Taking a break from the mothering obligations and indulging in tiny ways. Watching favorite show, taking a bubble bath, or lighting some relaxing scented candles are all great ways to calm down.

- **The ninth session:** this session was the final session designed to recap previous skills, acquire insight into women's experiences, and provide feedback on cognitive behavioral therapy.

Evaluation phase: -Post test data was obtained after one month from the cognitive behavioral therapy application using the same pretest assessment instruments. The aim was to evaluate the effect of the cognitive behavioral therapy intervention and comparing between pre and post-intervention in order to illustrate differences, similarities and gap of practices.

Statistical Analysis:

Data were collected, tabulated, statistically analyzed using an IBM personal computer with Statistical Package of Social Science (SPSS) version 22. Data were presented using descriptive statistics in the form of mean (X), standard deviation (SD), qualitative data were presented in the form numbers and percentages. Chi-square test (χ^2), Paired t-test, Wilcoxon signed rank test (non parametric test) and Pearson correlation (r) were used tests of significance. P value of > 0.05 was considered statistically non-significant, value of < 0.05 was considered statistically significant and the value of <0.001 was considered statistically highly significant.

Results

Table 2: represents that, about 50.4% of the studied women age is > 25 years old with mean age 26.45±7.3. Regarding to level of

education, 70.0% are secondary education, 57.7% of studied women lived in rural areas and 92.3% of studied women their religion is Muslim. Also, 90.0% are married and 63.1% are housewives. Finally, 53.8% of the studied women their socioeconomic status is low.

Table 3: illustrates that, 35.4% of studied women's birth order is the third pregnancy. Also, 61.5% of the studied women were planned for their current pregnancy, 53.8% their mode of delivery is vaginal and 61.5% have full term of gestational duration. Finally81.2% of studied women not has postpartum hemorrhage.

Figure 1: shows that, there is significant improvement in the levels of depressive symptoms among studied women in which 18.5% of studied women having stable or usual state in pre intervention increased to 46.5% in post intervention. In addition, 81.5% of studied women are having possible depressive symptoms in pre intervention, decreased to 53.5% in post intervention.

Table 4: represents that, there is statistical significance difference between pre and post intervention regarding to the total mean score of depressive symptoms among studied women in which the score of total mean of depressive symptoms is16.89±4.28 in pre intervention decreased to 12.98±3.599 in post intervention and p = .000. in addition, there is statistical significance difference between pre and post intervention regarding to the total mean score of sleep quality among studied women p = .000as shown in the table; the total mean score of sleep quality 38.34 ± 16.78 in pre intervention decreased to 33.13±14.33 in post intervention.

Table 5: shows that, 23.1% of studied women suffering from severe sleep problem in pre intervention, decreased to 8.4% in post intervention. After cognitive behavior therapy intervention, 35.7% of studied women with mild sleep problem in pre intervention improved to 51.2% in post intervention. Also, there are statistical significance improvements in the levels of sleep quality between pre-post intervention among studied women p =.000.

Figure 2: illustrates that, there are significant improvement in the levels of sleep quality among studied women and this evidenced by; 35.7% of studied women with mild sleep problem in pre intervention improved to 51.2% in post intervention. Also, 23.1% of studied women suffering from severe sleep problem in pre intervention, decreased to 8.4% in post intervention.

Table 6: illustrates that, there are negative correlation between total score of sleep quality and depressive symptoms after cognitive behavioral therapy intervention however, there is no statistical significance difference $p > 0.05$.

Table 7: clarifies that, there are statistical significance relations among socio-demographic characteristics and the total score of depressive symptoms among studied women in pre intervention at $p < 0.05\%$ except at level of education; there are no statistical significance difference ($p > 0.05$). Also, there are statistical significance relations among socio-demographic characteristics and total score of depressive symptoms among studied women in post intervention at $p < 0.05\%$ except at marital status.

Table 8: clarifies that, there are statistical significance relations among sociodemographic characteristics and the total score of sleep quality among studied women in pre intervention at p=.000. Also, there are statistical significance relations among sociodemographic characteristics and total score of sleep quality among studied women in post intervention at $p < 0.05\%$. These significance differences interpreted that, sleep quality is changeable critical variable and any intervention can be create considerable effect.

Table 2: Distribution of socio-demographic characteristics of studied women (n=260)

Socio-demographic characteristics	No.	%
Age (years)		
≤ 25	129	49.6
> 25	131	50.4
X ± SD: 26.45±7.295		
Level of education		
Illiterate	15	5.8
Basic education	28	10.8
Secondary	182	70.0
University	35	13.4
Place of residence		
Rural	150	57.7
Urban	110	42.3
Religion		
Muslim	240	92.3
Christian	20	7.7
Marital status		
Married	234	90.0
Divorced	17	6.5
Widowed	9	3.5
Working status		
Working	96	36.9
Housewife	164	63.1
Socioeconomic status		
Low	140	53.8
Medium	90	34.7
High	30	11.5
Total	260	100.0

Table 3: Distribution of current obstetric data among studied women (n=260)

Current obstetric data	No.	%
Birth order		
Primi gravida	60	23.1
Second	34	13.1
Third	92	35.4
Multi gravida	74	28.4
Current pregnancy		
Planned	160	61.5
Unplanned	100	38.5
Mode of delivery		
Vaginal	140	53.8
CS	120	46.2
Gestational duration		
Preterm	80	30.8
Full Term	160	61.5
Post-term	20	7.7
Occurrence of postpartum hemorrhage		
Yes	49	18.8
No	211	81.2
Total	260	100.0

Figure 1: Distribution of the levels of depressive symptoms among studied women in pre – post intervention (n=260)

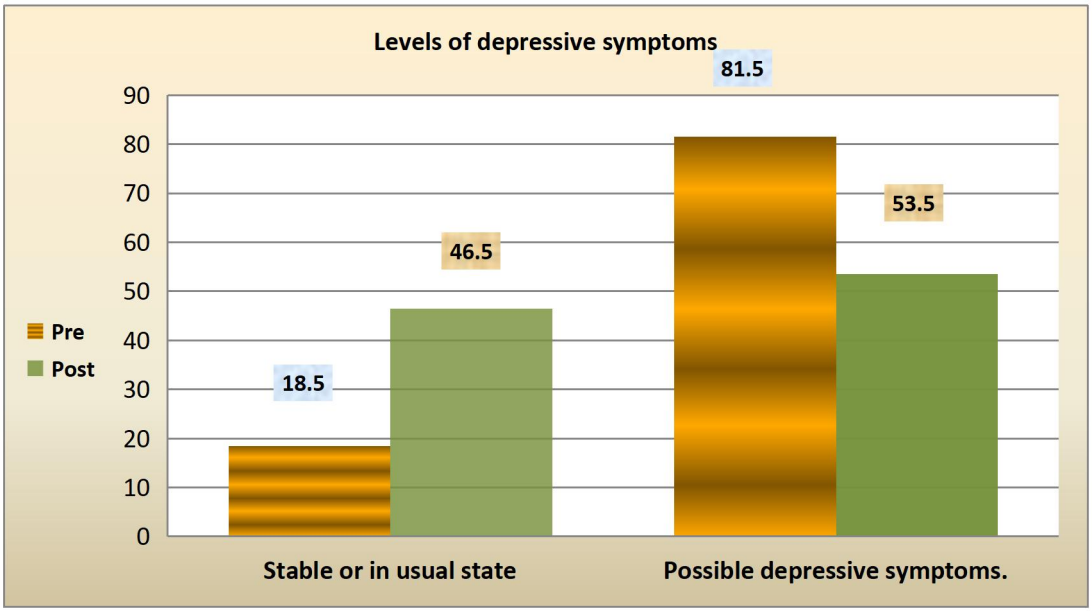

Table 4: Effect of cognitive behavioral therapy intervention on total score of depressive symptoms and total mean score of sleep quality among studied women in pre – post intervention (n=260)

The Edinburgh postnatal depression scale (EPDS) and Sleep quality scale (SQS)	Pre intervention	Post intervention	Paired t test	P value
Total mean score of depressive symptoms	16.89±4.28	12.98±3.599	25.625	.000
Total mean score of sleep quality	38.34 ± 16.78	33.13±14.33	6.756	.000

Table 5: Effect of cognitive behavioral therapy intervention on the levels of sleep quality among studied women in pre – post intervention (n=260)

Sleep quality scale (SQS) 28 items	Pre intervention		Post intervention		X^2	P value
	No.	%	No.	%		
Mild sleep problem	93	35.7	133	51.2		
Moderate sleep problem	107	41.2	105	40.4	2.800	.000
Severe sleep problem	60	23.1	22	8.4		

Figure 2: Distribution of the levels of sleep quality among studied women in pre – post intervention (n=260)

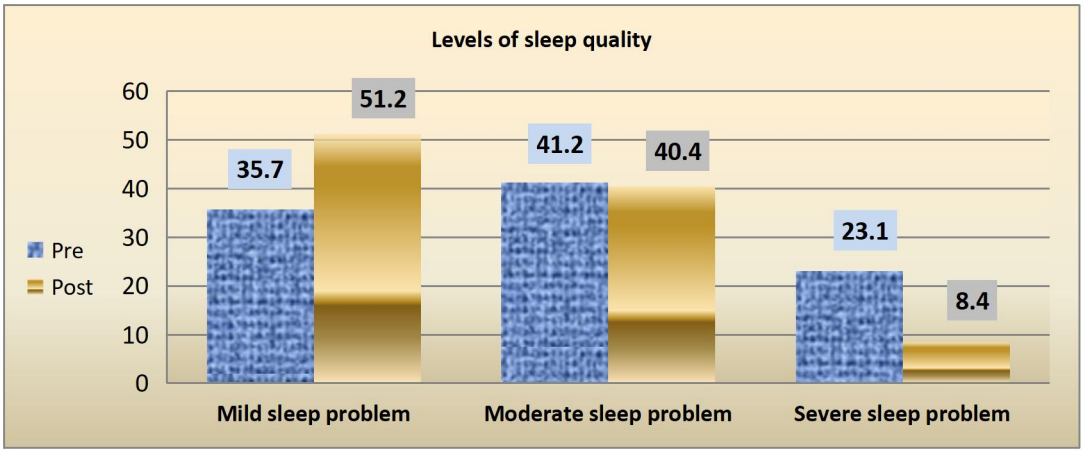

Table 6: Correlation between sleep quality and depressive symptoms after cognitive behavioral therapy intervention in pre- post intervention among studied women (n=260)

Correlation items	Pre intervention		Post intervention	
	r	P value	r	P value
Depressive symptoms total score Sleep quality total score	.017	.780	-.090	.15

Table 7: Relation between socio-demographic characteristics and total score of depressive symptoms among studied women in pre and post intervention

Socio-demographic characteristics	Total score of depressive symptoms pre intervention			Post intervention		
	X ± SD	Test	P value	X ± SD	Test	P value
Age category						
Less or =25	17.45±4.32	Wilcoxon 12.053	.000	12.87±3.58	Wilcoxon 13.747	.000
> 25	16.32±4.17			13.09±3.70		
Working status						
Working	16.19±3.38	Paired t test 13.999	.000	11.87±2.22	Paired t test 14.000	.000
Housewife	17.29±4.67			13.59±4.05		
Religion						
Muslim	16.97±4.35	Paired t test 59.24	.000	13.15±3.66	Paired t test 13.99	.000
Christian	16.00±3.27			10.95±1.96		
Marital status						
Married	17.09±4.46	Kruskal walis 6.563	.04	13.14±3.72	Kruskal walis 4.95	.084
Divorced	14.7±1.72			11.50±2.395		
Widowed	16.73±2.28			12.36±2.16		
Level of education						
Illiterate	19.47±3.48	Kruskal walis 7.863	0.49	10.87±1.995	Kruskal walis 8.740	.033
basic education	16.18±2.12			12.11±1.912		
Secondary	16.79±4.39			13.34±3.80		
University	16.91±5.01			12.71±3.72		
Socioeconomic status						
Low	17.28±3.91	Kruskal walis 10.44	.05	13.14±3.42	Kruskal walis 9.24	.010
Medium	17.08±4.03			13.39±3.56		
High	14.57±5.8			10.93±3.96		

Table 8: Relation between socio-demographic characteristics and total score of sleep quality among studied women in pre and post intervention

Socio-demographic characteristics	Total score of sleep quality Pre intervention X ± SD	Test	P value	Post intervention X ± SD	Test	P value
Age category		Wilcoxon			Wilcoxon	
Less or =25	37.84±16.33	8.666	.000	34.67±15.72		.000
> 25	38.85±17.28			31.54±12.599	5.114	
Working status		Paired t test	.000		Paired t test	.000
Working	49.16±17.28	34.78		35.37±15.93	35.28	
Housewife	32.31±13.09			31.88±13.24		
Religion		Paired t test	.000		Paired t test	.000
Muslim	38.34±16.44	35.80		33.06±13.898	36.074	
Christian	38.29±20.68			33.86±18.93		
Marital status		Kruskal	.001		Kruskal	.001
Married	39.79±17.02	wallis test		34.19 ±14.57	wallis test	
Divorced	25.45±6.63	14.86		23.35 ±5.77	13.635	
Widowed	31.55±13.05			28.82 ±13.32		
Level of education		Kruskal	.000		Kruskal	.000
Illiterate	55.20±4.81	wallis test		47.67 ±12.92	wallis test	
basic education	23.43±9.49	42.201		23.43 ±9.49	34.162	
Secondary	39.96±17.13			33.13 ±14.28		
University	34.63±12.8			34.63 ±13.00		
Socioeconomic status						
Low	44.8±16.7	Kruskal	.000	35.12 ±14.24	Kruskal	.033*
Medium	30.7±12.3	wallis test		29.96 ±12.50	wallis test	
High	34.5±18.4	39.371		34.53 ±18.42	6.850	

Discussion

Woman in postpartum period have many physical and psychological problems including poor sleep quality and arising of post-partum depressive emotions **(Özdemir et al., 2018).** Cognitive behavioral therapy can adjust women's poor cognition and eliminate bad mood by changing thinking and behavior, with cognitive reconstruction and behavior modification as the core **(Meltzer-Brody et al., 2018).**

Furthermore, nurses use CBT intervention in treating and preventing the occurrence of postpartum depression, sleep quality disturbance and all problems regarding the postpartum period that may affect negatively on the mothers **(Jannati et al., 2020).** This study aims to investigate or evaluate the effectiveness of cognitive behavioral therapy intervention on depressive symptoms and sleep quality among postnatal women.

Regarding to the effect of cognitive behavioral therapy intervention on the levels of depressive symptoms among studied women; the results of current study revealed that, the majority of studied women were suffered from possible depressive symptoms (risk for depression) in pre intervention which decreased to half of studied women in post intervention. As a result, about one third of studied women were have stable or usual state (no signs of depression) in pre intervention, improved to nearly half in post intervention and there were statistical significance improvement in the levels of depressive symptoms and p value =.000. These results were consistent with results conducted by **Chungu, (2017)** in ZAMBIA and reported that, intervention of CBT treatment had more reduction effect on Postpartum Depression than the Control treatment (Non-CBT), through change maladaptive cognitions among the patients.

Additionally, the finding of current study represented that, there was statistical significance improvement in the total mean score of depressive symptoms between pre and

post intervention among studied women. This result came in agreement with **Huang et al., (2018)**. Who found that, the cognitive behavioral therapy is sufficient to relieve the psychological symptoms of post natal depression and effectively improve the quality of life in new mothers, resulting in a reduced prevalence of postnatal depression. Furthermore, these results were congruent with **Jannati et al., (2020)** and illustrated that, postpartum depression treatment that based on CBT intervention have confirmed to be successful in the reduction of postpartum depressive symptoms. This consistency could due to the CBT is based on change of dysfunctional thinking which result from psychological influences. So, CBT modifying dysfunctional thinking, beliefs and behavior will lead to enhancement in depression's symptoms of an individual. CBT has a clear cure approach for postpartum depression though increase sense to patients and is based on patient's experience.

Regarding to the effect of cognitive behavioral therapy intervention on the levels of sleep quality among studied women; the findings of current study illustrated that, there were statistical significance improvements in the levels of sleep quality among studied women p =.000 this evidenced by that, more than one third of studied women suffered from severe sleep problem in pre intervention, decreased to less than one tenth in post intervention. As a consequence, one third of studied women with mild sleep problem in pre intervention, improved to more than the half in post intervention. Therefore, it can speculate that child care issues during night may have contributed to the observed effects on postpartum women's sleep. Also, the drop in hormone levels after the birth and unpredictable infant sleep patterns can affect a new mother's sleep quality.

In addition, the result of current study showed that, there was statistical significance difference between pre and post intervention in the total mean score of sleep quality among studied women. These results were consistent with study conducted by **Doering & Dogan, (2018),** who studied "postpartum sleep and fatigue intervention feasibility pilot study" and concluded that there was significant improvement in study group than in control group after one month. Furthermore, this results in the same line with **Li et al., (2021)** who studied "the clinical effectiveness of cognitive behavioral therapy for patients with insomnia and depression and stated that, CBT was an elective therapy for insomnia.

Additionally, the finding of current study was agreed with the study conducted by **Verma et al., (2021)** in Australian and revealed that, cognitive behavioral therapy and light dark therapy for maternal postpartum insomnia symptoms are relatively low-cost and more effective approach. This consistency might be due to that, non-pharmacological treatments, such as CBT, lead to improvement of insomnia without any side-effects that often accompany medications. So, these interventions have the potential to reach large numbers of postnatal women with disturbed sleep in the community and improve their sleep and well-being.

Concerning to correlation between the total score of depressive symptoms and sleep quality, the finding of current study revealed that, there was negative correlation after implementing of cognitive behavioral therapy intervention. Moreover, in the current study the psychological distress outcomes e.g. depression and disturbed sleep in studied women who received CBT intervention showed improvement lasting 6 months after the intervention ended. This negative correlation interpreted that, any improvement in sleep quality result in decreasing of depressive symptoms and highlights to what extent the cognitive behavioral therapy was effective intervention. This finding agreed with a study carried out by **Majd et al., (2020),** in Iran, who reported that, the CBT intervention shows promising effects in treating sleep problems for insomnia patients, after receiving the feasible and short CBT, insomnia patients showed improved sleep hygiene behaviors, enhanced sleep quality, and less insomnia severity.

Regarding to the relation between socio-demographic characteristics and total score of depressive symptoms, the result of present study indicated that, there was statistical significance relation among socio-demographic

characteristics and total score of depressive symptoms among studied women in pre intervention. This finding was consistent with study conducted by **Smorti, Ponti & Pancetti, (2019).** Who studied A Comprehensive Analysis of Post-partum Depression Risk Factors and concluded that postpartum depression is associated with several risk factors (woman's age and some clinical delivery difficulties).

Moreover, the result of current study indicated that, there was statistical significance relation among socio-demographic characteristics and total score of depressive symptoms among studied women in post intervention, except at marital status and this mean, the marital status may be another source of burden which aids in manifestation of depressive symptoms. This finding was contradicted by study conducted by **Chungu, (2017)** and found that, multiple regression analyses was conducted and there was no statistical significance variance between the groups in the demographic characteristics included employment status, age, education level; past history of depression and family history of depression and Postpartum Depression. This highlight that, the marital status may be another source of burden which aids in manifestation of depressive symptoms.

The findings of the current study also reported that there were statistical significance relations among socio-demographic characteristics and total score of sleep quality among studied women in pre intervention. Also, there are statistical significance relations among socio-demographic characteristics and total score of sleep quality among studied women in post intervention. These significance differences interpreted that, sleep quality is changeable critical variable and any intervention can be create considerable effect. This result agreed with **Tufail et al., (2018)** in Pakistan and who documented that, socio-demographic factors, like gender, age, education & residential status, significantly influence health and sleep quality among patients who suffered from insomnia.

Conclusion:

Cognitive behavioral therapy intervention was effective maneuver in preventing and managing the occurrence of postpartum depression symptoms. In addition, CBT intervention assist in improving the sleep quality (daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction) among post natal women.

Recommendation:

- Health education intervention based on preventive CBT should be provided to postnatal women to deal effectively with changes in sleep quality and manage depressive symptoms associated with postpartum period.
- Provide training program for nurses working in postnatal units including MCHCs to utilize cognitive behavioral therapy as a means to manage sleep disorders and depressive symptoms among postpartum women.
- Further research is suggested to be implemented on a wide range to include larger sample size for long period study.

Study limitation:

The most limitation of the current study was the crowdedness in the MCHCs because of the implementation of 100 million Seha program to support women's health coinciding with the time of the current study and this was covered by planned time table, availability of home visit services for the participated studied women were applied. Also, telephone follow up services by the researchers was used.

Practical implications

Based on the results of this study, the CBT intervention seems to be a suitable approach in helping post partum women in dealing with post partum depressive symptoms and improve sleep quality. Because the technique has a simple, clear, and understood framework, it can be conducted at any different settings on large sample.

Conflict of Interest:

There is no conflict of interest to be declared

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