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The Relationship between Sleep Quality, Physical Activity and Postpartum Mood

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Abstract: **Background: postpartum period is a very important time for both women and the newborn baby. Women may experience many changes, both physically and emotionally in the first few hours and days after childbirth. Women may look at neonate and feel happy but at the same time, may feel exhausted from a lack of sleep and new responsibilities. physical activity is also improve overall emotional well-being and mental health outcomes. The purpose of the study to assess the relationship between sleep quality, physical activity and postpartum mood.**
Research Questions:
(I): Is there a relationship between sleep quality and physical activity?
(II): Is there a relationship between sleep quality and postpartum mood?
(III): Is there is a relationship between physical activity and postpartum mood?
Methods: Describtive correlational design was utilized. Sample: A purposive sample of 144 of postpartum women. Setting: The study was carried out at postpartum department at University and Teaching Hospital in Shebin El-Kom at menoufia Governorate. Instruments: An interviewing questionnaire, the Pittsburgh Sleep quality Index (PSQI) Questionnaire, the Edingburgh Postnatal Depression Scale, Physical Activity Questionnaire. Results: There was a highly statistically significant difference between sleep quality and postpartum mood there was a highly statistically significant difference between physical activity and postpartum mood, there was no statistically significant difference between sleep quality and physical activity. Conclusion: postpartum mood is associated with sleep quality. There is positive a relationship between physical activity and postpartum mood and there is no difference between sleep quality and physical activity. Recommendations: Encouraging family support to postpartum women to improve sleep quality. Educating family to provide positive psychological support for postpartum women to decrease postpartum blues.

Keywords: **Sleep Quality, Physical Activity, Postpartum Mood.**

1. INTRODUCTION

The postpartum period is a period of 6 weeks in which all system organs including the reproductive organs return to their pre-pregnancy status, (Evenson, et al., 2018). Immediately after giving birth, it is common to have irregular periods. Women who are breastfeeding are more likely to notice irregular periods, as the hormones that support breastfeeding can cause the body to delay ovulation or ovulate infrequently. Even in women who are not breastfeeding, periods may be irregular, as the body takes time to recover from pregnancy and childbirth, (Moldenhauer, 2018).

Women may experience many changes, both physically and emotionally in the first few hours and days after childbirth. Women may feel irritable, indecisive, anxious, and prone to sudden mood swings after childbirth. Women may look at neonate and feel happy but at the same time, may feel exhausted from a lack of sleep and new responsibilities (Jacobson & Hilary, 2014).

According to Gjerdingen,D (2018), sleep is significantly disrupted during the postpartum period and therefore, may play an important role in the development of depression. Poor sleep can continue through 12 months following the birth of a baby and beyond. Lack of sleep can result in exhaustion, impatience, lower ability to concentrate, and a poor quality of life, which can all contribute to an increased risk for postpartum depression.

Sleep problems are related to postpartum mood. However, more research is needed regarding the long-term effect of poor sleep on postpartum mood. For example, several studies link poor sleep to postpartum mood, but some have examined postpartum depression at less than four weeks postpartum, (Lawson et al., 2017) additionally; several studies examined the correlation between depression and sleep at the same time points, even when assessing both sleep and depression at multiple time points in some studies. Therefore, the influence of poor sleep over time on the development of depression was not examined in these studies (American Psychiatric Association, 2017).

physical activity is also improve overall emotional well-being and mental health outcomes. Physical activity has been supported as an independent intervention with psychotherapy or pharmacology for the treatment of postpartum mood disorder. (Lopresti, Hood & Drummond, 2013). Sleep and physical activity are two such variables that may prevent and enhance medical and mental health conditions. Researchers have also begun to explore sleep and physical activity separately in relation to postpartum mood (Doucet, King, Levine & Ross, 2014).

Most new mothers experience postpartum blues after child birth which commonly include mood swings, crying spells, anxiety and difficulty sleeping. Baby blues begin within the first two to three days after delivery and may last for up to two weeks (Viguera, 2018).

According to Harrington &Terry (2015), nurses have a key role in educating, managing and supporting patients across arange of clinical and nonclinical setting (Ritchie, 2015). Communication is a key factor on how to get the information across with this age group. One of the most important techniques for this age group is to listen first and remain nonjudgmental and every effort should be made to give women a sense of modesty and privacy.

Education and support of women is a goal of nursing care during the postpartum period (Ladewig, London, & Davidson, 2016). It is the role of nurses to assess the psychological status of woman and instruct postpartum woman about the importance of regular activities. Women who engage in the physical activity at least three times per week exhibited better adaption to changes associated with the postpartum period and it is also important in improving postpartum mood. Also, good sleep quality is essential for optimal physiological functioning (Sampselle et al., 2014).

2. SIGNIFICANCE OF THE STUDY

The effects of physical activity on sleep quality could be an important mechanism for improving postpartum mood. Worldwide, women experience major depressive mood at higher rates than men and an estimated 20% of women are affected during their lifetime (Brommet et al., 2011). Following the delivery of a neonate, up to75% of women may be affected by “postpartum blues” (Sit & Wisner, 2011). Postpartum blues is a common condition that occurs after delivery with incidence ranging from 30-80% in Africa (Josephat ,M et al., 2015).

In Egypt, previous studies reported that the prevalence of postpartum mood disorder (20%) women fulfilled postpartum psychiatric disorders. They were classified into the following groups: postpartum blues, (68%), postpartum depression, (20%) ,postpartum panic disorder (8%) and postpartum generalized anxiety disorder, (4%) (Nabil, R & Mohammed ,S , 2015). Depend on the previous review and the percentages ,the researcher was motivated to assess the relationship between sleep quality, physical activity and postpartum mood.

Purpose of the Study

The study aimed to Assess the relationship between sleep quality ,physical activity and postpartum mood.

3. RESEARCH QUESTIONS

Question (I): Is there a relationship between sleep quality and physical activity?

Question (II): Is there a relationship between sleep quality and postpartum mood?

Question (III): Is there is a relationship between physical activity and postpartum mood?

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4. MATERIALS

Design:

Descriptive correlational design was utilized in implementing the present study.

Settings:

The study was conducted in postpartum department at University and Teaching hospitals in Shebin El Kom at Menoufia Governorate..

Subjects:

A purposive sample of 144 postpartum women was taken from the above-mentioned setting through the first 12 hours immediately after cesarean section at postpartum units. willing to participate in this study 44 women were selected from Menoufia University Hospital and one hundred women from Shebin El-Kom Teaching Hospital. They all fulfilled the inclusion criteria. which are Age range from 18-49, no postpartum complications interfere with physical activity ,no chronic disease, no history of postpartum depression or mood disorder for multi women., Single neonate no birth disorder or complications.

The selected women were then randomly assigned immediately after surgery (using simple randomization technique) to two groups (Group1 and Group2). Each one of the 144 women was asked to pick a piece of paper containing odd and even numbers. Those who selected an odd number was assigned to Group1 and those who selected an even number was assigned to Group2. This technique was used to avoid sample contamination and bias.

5. INSTRUMENTS OF THE STUDY

Instrument I: A structured interviewing questionnaire: It was based on the review of currently related literature and used by the researcher to collect the necessary data about the study participants. It included the following parts:

Part1: Socio demographic data (name, age, address ,telephone number, occupation and level of education)

Part2: History of previous pregnancy and labor (gravidity ,parity ,number of live children, number of dead children and the number of premature infant)

Part3: Current pregnancy and labor (follow up during this pregnancy , the cause for first visit , the desire for this pregnancy, problem during this pregnancy, number of gestational week at labor and the type of delivery)

Part4: Breast feeding (beginning of infant feeding ,methods of infant feeding , number of breast feeding and the problems during breast feeding).

Instrument II: Pittsburgh Sleep quality index (PSQI) **Questionnaire:**It was adopted from (Olivia, N, 2014). PSQI was used in this study to assess postpartum women sleep quality in postpartum period. It contains seven domains They are subjective sleep quality (SSQ) (question 12) ,woman respond was ranked as follows good SSQ (0), fair (1) and poor (2). Sleep onset latency (question 2 and question 7 num.(a)) where woman respond was ranked as follows >15 minute (2) ,10-15 minute (1) and <10 minute (zero). .Sum of Q2 A Q7 (A) 0 =0 ;1-2 =1 ;3-4 =2 . ,sleep efficiency (question 1, 3). Sleep efficiency = (hours slept x hours in bed) x100 % as hours slept (question 4) and hours in bed is calculated from responses to question 1 and 3) in which lower SE<85% (2) ,average SE >85-95 % (1) and higher SE >95 % (zero) .Sleep disturbance (questions 7 from b-k) The response of participant to each items was vary between none (zero) .once or twice (1) and three or more times a week(2). Sum of Q7 (b-k) 0=0; 1-10 =1 ;11-20 =2 ,sleeping medication usage (question 8)) The response of participant to each items was vary between none (zero) .once or twice (1) and three or more times a week(2). Daytime impairments (question 9 ,10 and 11) where women response was ranked as no (0), sometimes (1) and much (2) .Sum of Q9,10,11{ 0=0 }; {1-3 =1 }; { 4-6 =2}.

- The component scores are summed to produce score range(0-14) .

  Higher scores than 5 indicate worse sleep quality.

Instrument III: Physical Activity Questionnaire: It Was adopted from (Craig et al., 2003) and modified by the researcher as some items needed to be omitted as it is not applicable in our community

Physical activity	Score
NO	0
Usually	1
Always	2

Instrument IV - Edingburgh Postnatal Depression Scale: It was adopted from(Olivia Nash,2014).The Edingburgh Postnatal Depression Scale (EPDS) is a 10-item, self-rating questionnaire during the postnatal period. Each question has four optional responses, a scoring system of 0-3 points for each question. In questions 1,2,4 As much as I always could (0) , Not quite so much now (1) , Definitely not so much now (2) , Not at all (3). In questions (3,5.6.7.8.9.10) scoring as the follow

Not at all (0)
Definitely not so much now (1)
Not quite so much now (2)
As much as I always could (3)
The maximum score was 30.

Total score of items	Indication
1-8	Postpartum blues (need only support)
9-11	Possible depression (support ,rescreen after 4 weeks)
12 or more	High probability of experiencing clinical depression

6. METHODS

Data collection procedure:

An official permission was obtained from the directors of the above-mentioned settings to conduct the study. A full explanation about the purpose of the study was provided to the directors of the study settings. participants' information remained.

Pilot Study:

A pilot study was implemented to test the applicability of the instruments, the feasibility of the study and to estimate the time needed for data collection. It was performed on 10% of the total sample, which is equal to 14 women. Based on piloting results;All postpartum women participated in the pilot study excluded from the study sample because the researcher rephrased some questions and sentences, then set the final fieldwork schedule.

Procedures:

1- Data collection for this study was carried out in the period from March 2019 to June 2019

2- At the beginning, the researcher screened women to identify the eligible participants according to inclusion criteria.

3- First the researcher went to University Hospital 3 days weekly (Thursday, wensday and Tuesday) for 11 weeks, to select participant as the researcher interviewed 2-5 women a day. Then after 11 weeks, she went to Teaching hospital for 3 days a week (Monday , Thursday and Tuesday) from 2 p.m to 5 p.m for 5 weeks .The researcher interviewed 3-5 women a day then took telephone numbers to contact with them on the second week postpartum through telephone. Each one took 30-45 minutes to answered questions.

4- The first meeting with the woman was in postpartum department after 2 hours of delivery.

5- The researcher introduced herself to the participants and provided verbal explanation of the study. Verbal agreement was obtained from all participants . Each participant was informed that participation in the study was voluntary and she can withdraw at any time.

6- The researcher provided verbal explanation about the study in simple terms. Also , she answered all questions of the women about postpartum period and its problems also, gave woman some instuctions about sleep quality, Physical activity in postpartum , postpartum blues and how to cope with it .Also, gave the woman prochure containing all instructions.

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7- Each women was interviewed to collect the data related to socio-demographic characteristics.

8- The researcher called women in telephone in the second week of postpartum to complete questionnaires that assess the sleep quality ,physical activity and postpartum mood

STATISTICAL ANALYSIS

Data were collected, tabulated, statistically analyzed using an IBM personal computer with Statistical Package of Social Sciences (SPSS) version 22 (SPSS, Inc, Chicago, Illinois, USA).

The following statistical devices were used:

a- Descriptive statistics: in which quantitative data were presented in the form of means ($\overline{X}$), standard deviations (SD), ranges where as qualitative data were presented in the form numbers and percentages.

b- Analytical statistics: was used to find out the possible association between the studied factors and the targeted disease. The used tests of significance included:

- Chi-square test ($\chi 2$): was used to study the association between the two qualitative variables.
- Fischer exact test for 2 x 2 tables when expected cell count of more than 25% of cases was less than five and p-value < 0.05 was considered significant.
- Student t-test: is a test of significance used for the comparison between the two groups having quantitative variables.
- Pearson's correlation (r): is acoefficient used to measure the association between quantitative variables.
  - P value of >0.05 was considered statistically non-significant.
  - P value of <0.05 was considered statistically significant.
  - P value of <0.001 was considered highly statistically significant.

7. RESULTS

Table (1): **Socio-demographic Characteristics of the Studied Women *(n=144)***

Variables	***No (n=144)***	***%***
Age *group*		
18-25 years	51	35.4
26-35 years	72	50.0
36-40 years	21	14.6
Marital status		
Married	132	94.3
Divorced	6	4.3
Widow	2	1.4
Level of education		
Illiterate	20	13.9
read and write	46	31.9
Secondary	41	28.5
University	35	25.7
Occupation		
Employee	28	19.4
House wives	116	80.6
Income		
Enough	120	83.3
not enough	24	16.7

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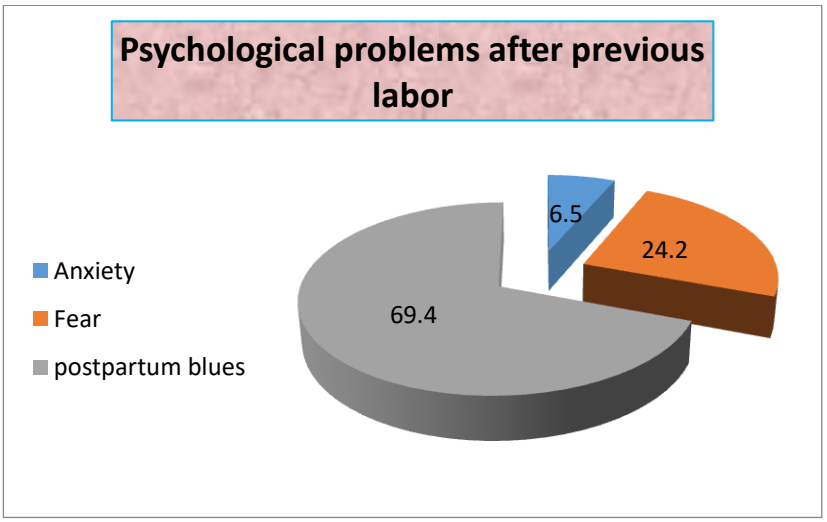
Table (1): shows the socio-demographic characteristics of the studied women according to their age. Half of the studied women (50%) their age ranged between 26-35years while less than half (14.6%) their age ranged between 36-40 years . Concerning occupation more than half (80.6%) housewives, while less than half (19.4%) employee. Regarding the educational level about one third of the studied women (31.9%) could read and write while the lowest percentage (8.3%) had university education. As regards income, the majority (83.5%) had enough income while minority (16.7%) did not have enough income.



Psychological problems after previus labor is illustrated in figure (1). It is evident that the majority of women (69.4%) had postpartum blues ,where as (6.5%) had anxiety.

Table (2): History of Current Pregnancy for the Studied Women (n=144)

.Variables	*No (n=144)*	*%*
Do you have follow up during this pregnancy?		
Yes	136	94.4
No	8	5.6
If yes where?		
Hospital	16	11.8
private clinic	6	83,8
MCH	114	4,4
Do you want this pregnancy?		
Yes	138	95.8
No	6	4.2
Do you have any problem during this pregnancy?		
Yes	66	45.8
No	78	54.2
If yes, What ?		
PIH	7	10.6
Gestational diabetes	2	3.0
(Anemia)	57	86.4

Table (2): shows the history of Current Pregnancy for the Studied Women Regarding follow up during this pregnancy the majority of women (83.8 %) were go to a private clinic for follow up . Concerning whethere they want this pregnancy, the highest percentage (95.8%) had desire for this pregnancy. Less than one third had medical problems (45.8%) .Problems were mainly PIH , gestational diabetes ,anemia respectively representing 10.6% ,3.o% ,86.4% respectively.

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Table (3): History of Current Labor for the Studied Women (N=144).

Variables	*No (n=144)*	*%*
Sex of infant		
Male	68	47.2
Female	76	52.8
Type of delivery		
Normal with episiotomy	24	16.7
C.S	107	74.3
Instrumental	13	9,0
Are you afraid of labor ?		
Yes	118	81.9
No	26	18.1
If yes, What is the cause?		
Labor pain	86	72.9
Baby and family member responsibility	32	27.1

Table (3) :shows the history of Current Labor for the Studied Women. It is noticed that more than half of women (52.8%) had female infant while (47.2%) had male infant .As regards the type of delivery, the majority (74.3%) delivered by C.S while minority (9.0%) had instrumental delivery. The highest percentage (81.9 %) were afraid of labor as more than half (72.9 %) were afraid of labor pain while the lowest percentage (18.1 %) were not afraid of labor. The majority of the studied women (88.9%) had no problems in their homes.

Table (4): Breast Feeding pattern among the Studied Women (n=144).

Variables	*No (n=144)*	*%*
When you start breast feeding after delivery?		
Immediately after labor	14	9.7
After two hours	9	6.3
After four hours	4	2.8
After six hours	28	19.4
After eight hours	40	27.8
More than 8 hours	49	34.0
Method of infant feeding?		
Breastfeeding	126	87.5
Combination of breast feeding and artificial feeding	18	12.5
How many times did you breast fed your baby?		
4 times or less	6	4.2
5-8 times	17	11.8
9-12 times	69	47.9
more than 12 times	52	36.1
Do you have any problem during breastfeeding		
Yes	50	34.7
No	94	65.3
If yes , What?		
Cracked nipple	50	100.0

Table (4) : shows breast Feeding among the studied women .It is noticed that (9.7 ,6.3 , 2.8 ,19.4 ,27.8 ,34.0) respectively

start breastfeeding (immediately after labor, after two hours , after four hours ,after six hours ,after eight hours , more than eight hours respectively. Concerning the methods of infant feeding ,the majority (87.5 %) depended on breastfeeding while the minority (12.5%) depended on formula feeding combined with breast feeding. While the majority of the studied women (47.9%) fed their babies from 9-12 times while the lowest percentage (4.2%) fed their babies 4 times or less. Regarding problems during breastfeeding , more than half of the studied women (65.3%) had no any problem while (34.7%) had problems during breast feeding. The highest percentage (100%) had cracked nipples.

Table (5): Sleep Quality Pattern Applying Pittsburg Sleep Quality Questionnaire (Disturbance Domains) for the studied women (n=144).

Variables	No Time		Once or twice		Three times or more	
	No	%	No	%	No	%
Did you have trouble in sleeping? This is because						
get up to use the bathroom	52	36.1	64	44.4	28	19.4
cannot breathe comfortably	144	100.0	0	0.0	0	0.0
cough or snore loudly	144	100.0	0	0.0	0	0.0
feel too cold	95	66.0	21	14.6	28	19.4
feel too hot	109	75.7	11	7.6	24	16.7
had bad dreams	139	96.5	0	0.0	5	3.5
had pain	40	27.8	58	40.3	46	31.9
infant did not sleep	0	0.0	7	4.9	137	95.1
breastfeeding	0	0.0	0	0.0	144	100.0
wake up in the middle of the night or early morning	7	4.9	13	9.0	124	86.1

Table (5): shows Pittsburg Sleep Quality Questionnaire (Disturbance Domains) for the studied women. Nearly half of studied women (44.4%) got up once or twice go to bathroom at night while (19.4 %) got up three times or more go to it. More than half of women (66%) did not feel too cold at night while (14.6%) felt too cold once or twice. Also, the majority of studied women (75.7 %) did not feel too hot while the minority (7.6 %) feel too hot once or twice. Most of the studied women (96.5%) did not have bad dreams while (3.5 %) had bad dreams three times or more. Also, about (40.3 %) of women had pain caused troubles during sleep while (27.8%) did not have pain.

The same table also revealed that the majority (95.1%) had trouble during sleep because infant did not sleep at night. Also, (100%) of the studied women had trouble during sleep because of breastfeeding three times or more at the night. Most of women (86.1 %) woke up three times or more in the middle of the night or early morning.

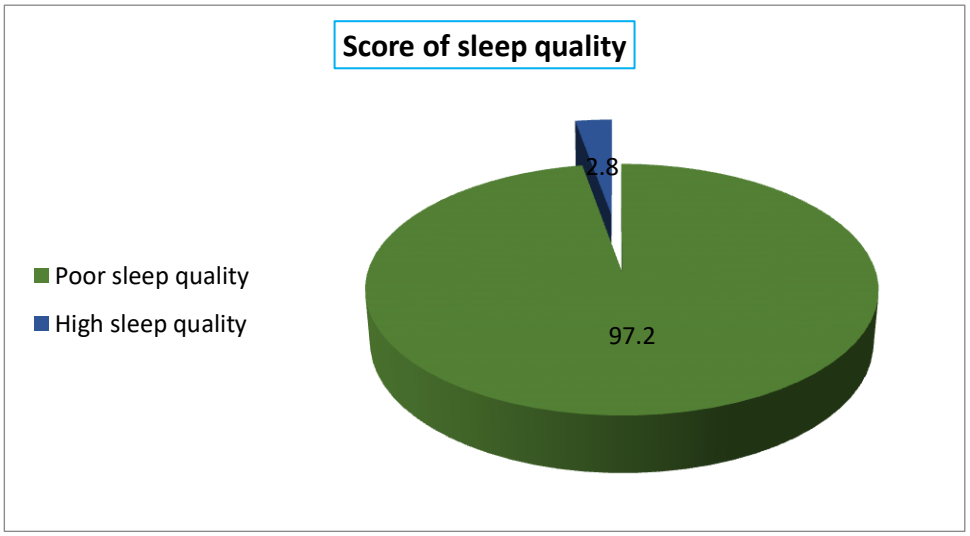

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Figure (2) :shows the total score of Pittsburg Sleep Quality Questionnaire for the studied women. The majority of women (97.2%) had poor sleep quality while (2,8%) had high sleep quality with mean ± SD (10.36 ± 2.72).

Table (6): Total score of Physical Activity Questionnaire among the Studied Women (n=144).

Varibles	*No (n=144)*	*%*
Total score of activity level		
Low activity level	88	61.1
High activity level	56	38.9
Mean& SD	12.86 ± 2.27	
Range	7- 23	

Table (6): shows the total score of Physical Activity Questionnaire among the studied women. More than half (61.1%) had low activity level while (38.9%) of the studied women had high activity level**.**

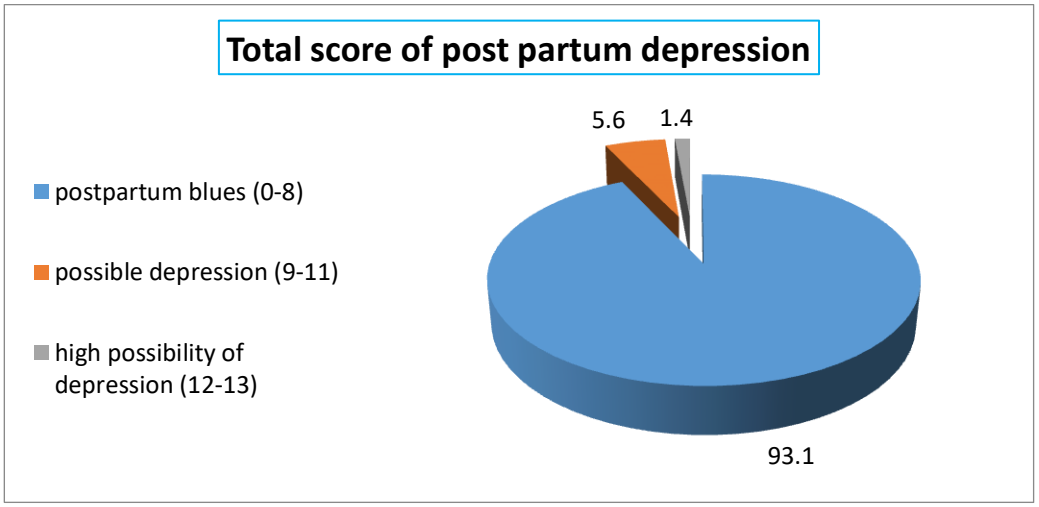

Figure (3): shows the total score of edinburg postnatal depression Questionnaire among studied women**.** The majority of women (93.1%) had postpartum blues while (1,4%) had high possibility of depression

Table (7): Pearson Correlation among total score post-partum mood, total score of Sleep Quality and total score of Activity Level.

Items	Sleep quality		Activity level	
	r	**P –value**	**r**	**P –value**
Total score of activity level	-.051-	.543		
Total score post-partum mood	.274**	.001	.171*	.040

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table (7) : Pearson Correlation between total score Post-partum Depression the total score of Sleep Quality and total score of Activity Level. It is revealed that there was no statistically significant difference between sleep quality and activity level . There was highly statistically significant correlation between total score postpartum depression and sleep quality where **p (.040).** Also, there was significant correlation between total score postpartum depression and activity level where **p (.001)**.

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8. DISCUSSION

Discussion encompasses the socio-demographic characteristics, Obstetrical history for the studied women as well as breastfeeding history. Also, it includes the correlation between the total score of sleep quality and the total score of activity level, correlation between the total score post-partum mood and the total score of sleep quality , correlation between total score post-partum depression and total score of activity level.

The present study showed that the majority of the studied women their age ranged between 26-35 years . This may reflect that women in the study were child- bearing age. This may be rationalized as the majority of women were married at this age which is considered as a middle reproductive. Women in their childbearing are susceptible to mood disorder due to pregnancy and postpartum.

This result is in line with those of **Okyay,E (2018)** who investigated The effect of physical activity level at postpartum period on the quality of life and depression level in Malatya, Turkey. It is reported that the mean age of the women was 28.93±5.24. Also, this finding was in harmony with **Sohrab Iranpour et al., (2016)** who investigated the association between sleep quality and postpartum mood. in Isfahan, Iran. Their findings revealed that the mean age of studied women is 26,5±5,2. There is a relationship between age and postpartum mood. With the progress of age, women had completed family number and so have much responsibility that may affect their mood**.**

As regards education, the majority of the studied women could read and write while the minority of them had university education. This may be rationalized as most women are from rural areas and their culture rules that girls look forward to getting married more than learning and completing the school. This was supported by with **Heidari, M, (2016)** in Iran who investigated. The prevalence of maternal blues, postpartum depression and their correlation with premenstrual syndrome in women referred to health centers. The findings revealed that high percentage of women were primary school. In contrast, study conducted by **Laura Creti et al, (2018)** in Canada who investigated Sleep in the Postpartum: Characteristics of First-Time, Healthy Mothers revealed that the majority of women had completed postsecondary education.

Regarding occupation, the present study revealed that the majority of the studied women were housewives. The majority of them could read and write and their culture rules to become housewives more than working.The findings were supported by the study of **Iranpour, S, (2016)** in Iran, who investigated the association between sleep quality and postpartum mood . The finding revealed also that women were housewives as they did not know about postpartum mood and how to deal with it. Also they were supported by a study conducted by **Kheirabadi, G, etal, ,(2016)** who revealed that women not working mothers tend to be exposed to postpartum mood disorder as they may have not any support to express their feelings.

Moreover, the present findings revealed that the majority of the studied women used breast feeding as a method for infantfeeding. This may be rationalized as it is culture in rural areas to use breastfeeding than any other method. The findings are also in line with a study conducted in America by **Olivia ,N, (2014)**, who investigated the relationship between sleep quality, physical activity and postpartum mood and their finding revealed that the majority of the women used breastfeeding as method of infant feeding. This may reflect one of the main causes of sleep disturbance during nighttime.

Regardind pregnancy follow up ,the majority of studied women in the present study had follow up during pregnancy for antenatal care due to increased health needs that arise during pregnancy. All literature emphasized the importance of antenatal education and care to avoid any complication during pregnancy , labor and postpartum period that may affect their postpartum mood. This result is rationalized as there is much more concern and interest from ministry of health about the importance of antenatal care as strategic plan to improve women health. This current finding was confirmed by **Olivia, N, (2014)** in America and **Hildingsson et al., (2016)** in Sewden whose finding revealed that women had access to healthcare using medical assistance having private health insurance and had antenatal follow up.

Moreover the present finding revealed that the majority of the studied women delivered by C.S as some women prefer to deliver by surgery because they can avoid normal labor pain. It can also reduce some anxiety of waiting for labor to start. But, some women had medical causes such as obstructed labor making them delivere through C.S. This is supported by **Okyay,E,(2018).** conducted a study in Malatya, Turkey. The findings revealed that the majority of participants delivered

by C.S and they werenot able to perform physical activity but need support from the family.

The present study also revealed that the majority of women slept less than 7 hours. This is because of many factors cause sleep disturbance such as neonate crying and breastfeeding and so they had moderate sleep sufficiency. This is supported by **Libman, E et al, (2017)** who conducted a study in Canada, revealing that average night time total sleep time was 6.29 hours. Also, it demonstrated that women had difficulty initiating or maintaining sleep. **Olivia, N, (2014)** also demonstrated that the participants in this sample also reported sleep disturbances that included poor sleep quality as well as significant symptoms of insomnia.

The present study found that most women suffered from day time dysfunction which means poor sleep quality that affects their concentration , ability to perform any activity during day and also affect their mood .This may be rationalized as there are many factors that cause sleep disturbance as infant care , breastfeeding and also baby cry decrease sleep sufficiency. Therefore, they all cause daytime dysfunction.

This findings were similar to those of **Dorheim, et al., (2014)** in America who revealed that women reported sleep disturbance and daytime dysfunctions .In addition, these findings were supported by a similar study conducted in USA by **Gjerdingen, D, et al., (2018)** who revealed that women faced sleep disturbance and discussed Potential prevention strategies that could include feeding the baby more often during the day, keeping the baby close in the evening to encourage cluster feeding before bed, and going to bed immediately after feeding the baby at night. Additionally, good sleep hygiene and habits should be taught that could include naps that are short in duration, limiting light exposure during the night, avoiding caffeine after a certain time, relaxation exercises, and cognitive restructuring to address worrying.

The present study found that most studied women had poor sleep quality due to sleep disturbance, did not sleep enough duration and had daytime dysfunction. It was supported by a similar study conducted in Iran by Kheirabad, G, (2016) to investigate association between sleep quality and postpartum mood and found that participant had sleep disturbances and poor subjective sleep quality . Tis was associated with depression in postpartum.

The present study revealed that most studied women their physical activity low immediately and few days after delivery. The women could not do much physical activity due to C.S surgery and normal labor. So, they needed assistance from others. This result was similar to study in Malatya, Turkey conducted by **Okyay, E, (2018)** who concluded that most women had low physical activity. By contrast the study conducted in America by **Olivia,N, (2014))** who investigated the relationship between sleep quality, physical activity and postpartum mood. The finding revealed that most participants had high physical activity. This is may due to this study was up to 6 months postpartum and women had the ability to do any physical activity.

The findings of the present study revealed that the majority of studied women had postpartum blues as it may be due to hormonal changes such as the decrease of pregnancy hormones (progesterone and estrogen) andthe increase of prolactine during postpartum period. These hormonal changes may produce chemical changes in the brain resulting in depression combined with stress, isolation, sleep deprivation, and fatigue, all of which contribute to postpartum blues**.** These findings were similar to a study in Canada conducted **by (Catherine S, et al., 2017)** who investigated disturbed sleep and postpartum mood. Their findings the revealed that the majority of women had postpartum blues**.**

The finding of the present study revealed that there is no statistically significant correlation between sleep quality and physical activity. This is rationalized as poor sleep quality may be due to pain of wound after C.S , infant care and breast feeding not due to limited physical activity. These results were similar to a study conducted by **(Einerson,B, 2019)** who investigated the association between sleep quality and physical activity in postpartum women. This showed that there was no clinically significant differences in physical activity between women with good and poor quality sleep. Also they were similar **(Penelope ,P, 2019)** who investigated Physical activity and sleep quality and duration among Hispanic postpartum women. The findings revealed that there were no statistically significant relationships between physical activity in any other domain or intensity and sleep quality or duration .It also supported by **Olivia ,N, (2014)** the relationship between sleep quality, physical activity and postpartum mood who showed sleep quality was not found to be correlated with physical activity.

This study revealed that there is astatistically significant positive correlation between sleep quality and total score postpartum depression as poor sleep quality is associated with postpartum blues symptoms. Many of the major

neurotransmitter systems involved in the regulation of sleep are responsible for multiple functions in the brain, including functions relevant to psychiatric disorders.

These findings are similar to those found in the study on postpartum women conducted by **(Russell JA, et al, 2015).** Sleep represents a dramatic change in physiologic state — one that occurs nightly. Sleep results from alterations in the balance of major neurotransmitter systems in the brain. Serotonin, norepinephrine, histamine, dopamine, melatonin, γ-aminobutyric acid and acetylcholine are all major players in the coordination of sleep and wake behaviours. Concentrations of estrogen, progesterone increase during pregnancy and drop to pre-pregnancy levels within a few days after childbirth.

These changes could be implicated in the fatigue and insomnia Also, this agrees with the study investigating post-partum depression and the mother-infant relationship in a South African conducted by **(Esmaillzadeh,A , 2016)** who found that there was an association between sleep quality in women who had given birth and the symptoms of postpartum depression.

Dørheim,S (2012) also investigated Sleep and Depression in Postpartum Women: A Population-Based Study found Poor sleep was also associated with postpartum mood. Also (**Swain et al ,2015**) found correlation between time spend awake at night and postpartum mood during first postpartum week as it lead to postpartum blues.

Okun,M, (2018) carried out study in USA and showed that Symptoms of insomnia and poor sleep quality are independently associated with greater depressive symptoms across pregnancy and throughout postpartum.

The findings of the present study revealed that there was statistically significant correlation between physical activity and postpartum mood as when physical activity increase, symptoms of postpartum blues decrease. There is a decline in physical activity due to the physiological changes during postpartum period and neonate care responsibilities. A reduction in the level of physical activity poses a risk for chronic health problems that adversely affect women's quality of life, at the same time contribute to the faster progression of psychological problem. Exercise also promotes brain cell development, increases the level of serotonin in the brain, and can help women get rid of the postpartum mild depression.

This finding is similar to that of **Okyay,E (2018)** Malatya, Turkey who found that there was a significant correlation between the physical activity and postpartum mood. Similarly, **Leon et al**., (**2018**) who investigated the effect of exercise on postpartum depression. Their findings revealed that physical activity in the postpartum period reduced the symptoms of postpartum depression.

Currie and Develin, (2017) reported that even low-intensity aerobic activities such as walking with a baby care lead to a significant reduction in the symptoms of postpartum depression . Walking alone, as you can see from this study, can significantly reduce the level of depression and affect the body in the positive direction. Also, **McCurdy et al., (2017)** investigated the effect of physical activity on symptoms of mild-moderate postpartum depression and their findings revealed that physical activity reduced the symptoms of mild-moderate depression.

Based on the present finding, the three questions of this study were answered which are as follows: Is there sleep a relationship between sleep quality and physical activity?, Is there relationship between sleep quality and postpartum mood? and Is there relationship between physical activity and postpartum mood?.

9. CONCLUSIONS

According to the study finding, it was concluded that:

The entire study participants had poor sleep latency, Most of them had sleep disturbance and daytime dysfunction. The majority of participants had poor sleep quality. Most studied women had low physical activity but the majority of them had postpartum blues.

There was no statistically significant relationship between physical activity and sleep quality and this was answer to question one. There was highly positive statistically significant correlation among sleep quality and postpartum mood as when sleep quality improve postpartum mood improves and this was answer to question two. Also there was positive statistically significant positive correlation between physical activity and postpartum mood as when physical activity increases postpartum mood improves and this was answer to question three.

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10. RECOMMENDATIONS

Based on the finding of the present study the following recommendations were suggested:

- Encouraging family support to postpartum women to improve sleep quality.
- Educating family to provide positive psychological support for postpartum women to decrease postpartum blues.
- Educating mother how to manage causes of sleep disturbance.
- Encourging women to start light physical activities after postpartum C.S and normal delivery to decrease postpartum blues.

Further researches are needed to explore

- The impact of psychological status of pregnant women on postpartum mood.
- The impact of sleep disturbance on quality of life of postpartum women.
- Assess quality of sleep during pregnancy and its adverse
- Outcomes on postpartum women.
- There is a need for nursing psychological intervention for women with psychological problem.
- Educational program to maternity nurses to assess postpartum mood among postpartum women

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