Relationship of Sleep Quality, Mood, and Work Schedule among Low Income Women During Pregnancy and Postpartum

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Learning Objectives

- Describe the sleep quality during pregnancy and early postpartum and its relationship with maternal mood, gestational diseases, and work schedule.

- Discuss the consequences of poor sleep quality during pregnancy.

Background

- Growing evidence indicate that sleep quality during pregnancy affects the mother's health, which in turn affects the infant's health.

- Pregnant women who slept less than eight hours a night were found to be at an increased risk for delivering small for gestational age infants (Abeysena, Jayawardana, & De A. Seneviratne., 2009).

Background

- Sleep disturbance in early pregnancy was associated with development of hyperglycemia during gestation (Izci Balserak, Jackson, Ratcliffe, Pack, & Pien, 2013).

- Shorter sleep duration in the third trimester was also found to be associated with higher blood pressure, while risk for pre-eclampsia was 9.5-fold higher in very short sleepers (<5 h) versus women with adequate sleep (Williams et al., 2010).

Background

- Women below poverty with low household incomes reported ≤6 hours of sleep (Schoenborn , 2013).

- Understanding of how biobehavioral factors interact within a population that is most vulnerable to infant morbidity and mortality is needed, so that appropriate interventions can be developed to positively affect health outcomes.

Purpose of the Study

- To assess the self-reported sleep quality during pregnancy and the early postpartum and test its relationship to mood, blood glucose, development of gestational related disease (diabetes, hypertension preeclampsia), as well as work schedules use among low in come women.

Material and Methods

- **Study Design, Sample and Settings**
  - A prospective longitudinal observational study was conducted.
  - Ninety two primiparous women were recruited from a Midwestern prenatal clinic serving underserved population and low income mothers.
  - Inclusion criteria were primiparity, 18-40 years of age, expecting a singleton infant, and willingness to feed baby breast milk.

Material and Methods

- **Tools, data collection, and study timeline**
  - Pittsburg Sleep Quality Index (PSQI; Cronbach's α =.69 (Buysse, 1989; Carpenter & Andrykowski, 1998)
  - Edinburgh Postnatal Depression Scale (EPDS; Cronbach's α = 0.87 (Cox, Holden, & Sagovsky, 1987)
  - Demographic and intake survey
  - Subjects' medical record.

Material and Methods

- Women were enrolled at ≤22 weeks gestation.

- At time of enrollment women completed the intake survey.

- During gestation week 22 (G22), G32 and 1 week post-partum (PPW1; 7-14 days after birth of baby) women completed the PSQI and EPDS surveys on-line (via Qualtrics™) or by phone interview.

Material and Methods

Table 1. Time line of data collection from subjects					
Weeks of gestation (G) and postpartum (PP)	≤G22	G22	G32	PP1	PP4&8
Collect demographic data	X				
Assess sleep[1], mood[2]		X	X	X	X
Report breast fullness and timing of lactation onset				X	
Report breastfeeding outcome				X	X
1. Pittsburg Sleep Quality Index 2. Edinburgh Postnatal Depression Scale					

Data Analysis

- All data collected were entered and stored on a secured server (RedCap).

- Statistical analysis was conducted using SPSS; P-value≤0.05 was considered significant.

- Descriptive statistical analysis of demographic and life style factors was performed.

- Mixed model analysis of variance (ANOVA) was used.

- Mann-Whitney test, the relationship of sleep quality to EPDS score, blood glucose level, and gestational related disease.

Results

- Of the 92 women enrolled, 42 women completed all time points of the study.

- Twenty-five percent was withdrawn from the study by members of the research staff due to failure to comply with study protocol.

- Changes in health status or other life events prevented 23% of women from completing the study.

- The remaining women who did not complete the study changed their minds about participating

Results

Table 1. Sample Demographics (n=42) & Health Information		
Variables	**n = 42**	**（%）**
Race		
African American	**26**	**63.64**
White	8	18.18
Asian	1	2.27
More than one race	4	11.36
Unknown/not reported	2	4.54
Ethnicity		
Hispanic or not	6	13.63
Not Hispanic or Latino	**36**	**86.36**
Education		
Associated degree	3	7
Bachelor and graduate degrees	11	25
High school or GED	**26**	**63**
<high school	2	5
Income		
Less than $10,000	**19**	**45**
≥$10,000, but <$25,000	10	23
≥$25,000, but <$50,000	10	23
≥$50,000	3	9
Percent of diagnosis/category		
Pre-eclampsia	5	11.36
GDM	3	9.09
hypertension	11	25
Any gestational disease	13	31.81
BMI ≥25	19	45.45
hyperglycemia (blood glucose ≥ 130 mg/dL)	7	16

Results

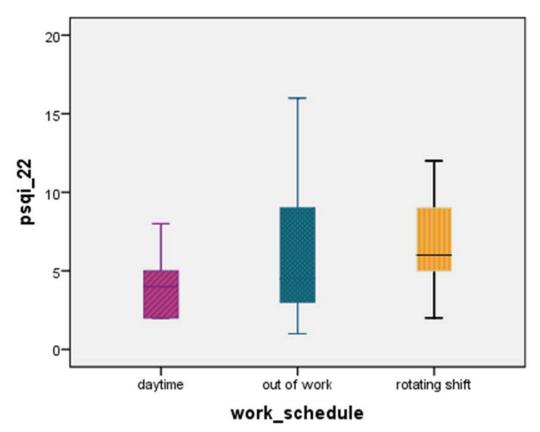PSQI scores during gestation week 22 (G22), G32 and postpartum week1 (PPW1)

PSQI	G22	G32	PPW1
No. of subjects completing survey	54	47	42
Score Range	1-15	1-15	1-18
Mean score	5.5	6.43	6.97
Median Score	5	6	6.5
No. (%) with score >5	22 (40.7%)	27 (57.5%)	20 (55.6%)
Percentage>5	40.74%	57.45%	55.56%

Results

- EPDS scores during gestation week 22 (G22), G32 and postpartum week 1 (PPW1)

EPDS	G22	G32	PPW1
Total	56	47	42
Range	0-17	0-16	0-17
mean	6.25	6.55	4.9
median	6	7	5
Depression No.	16	12	6
Depression Rate	28.57%	25.53%	15.38%

Results

Relationship of work schedule and sleep quality score during gestation week 22

Using one way ANOVA test(assume constant variance), we found out there is significant difference between PSQI scores for three types of work schedule(with p value=0.029), people who have rotating shift work have much higher(2.62) PSQI scores than people who have work(p value=0.036).

Results

- **Correlation between EPDS and PSQI**

Correlations

		PSQIHSE	Total	EPDS
PSQIHSE	Pearson Correlation	1	.677**	.210
	Sig. (2-tailed)		.000	.124
	N	55	54	55
Total	Pearson Correlation	.677**	1	.533**
	Sig. (2-tailed)	.000		.000
	N	54	54	54
EPDS	Pearson Correlation	.210	.533**	1
	Sig. (2-tailed)	.124	.000	
	N	55	54	56

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

GW 22

Correlations

		EPDS	PSQI	PSQIHSE
EPDS	Pearson Correlation	1	.578**	.109
	Sig. (2-tailed)		.000	.467
	N	47	46	47
PSQI	Pearson Correlation	.578**	1	.577**
	Sig. (2-tailed)	.000		.000
	N	46	47	47
PSQIHSE	Pearson Correlation	.109	.577**	1
	Sig. (2-tailed)	.467	.000	
	N	47	47	48

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

GW32

Correlations

		EPDS	PSQIHSE	Total
EPDS	Pearson Correlation	1	.130	.294
	Sig. (2-tailed)		.444	.082
	N	39	37	36
PSQIHSE	Pearson Correlation	.130	1	.607**
	Sig. (2-tailed)	.444		.000
	N	37	37	36
Total	Pearson Correlation	.294	.607**	1
	Sig. (2-tailed)	.082	.000	
	N	36	36	36

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

PPW1

Results

- Rate of poor sleep quality increased between G22 and PPW1. At G22 and G32, 25% of women had EPDS scores indicative of symptoms of depression; rate dropped to 12% at PPW1.

- PSQI and EPDS scores were positively correlated between G22 and G32, supporting a link between sleep quality and mood.

Results

- Women with hypertension, gestational diabetes and/or preeclampsia had poorer sleep quality at G22 and PPW1 (P=0.1).

- At G22 women who worked nights or shift schedules had significantly (P<0.05) poorer sleep scores.

- Women who were out of work had the most variability in sleep scores, which were not different from night or shift workers.

Conclusions

- In a population at high risk for maternal and infant morbidity, poor sleep quality during pregnancy was associated with poor mood, night work and development of gestational related disease.

- Interventions that target sleep hygiene may be effective in improving health outcomes of mothers and developing babies.

Limitations of the Study

- The small sample size precluded analysis of subpopulations who exhibit high risk behaviors associated with poor neonatal health outcomes.

- High rate of withdrew due to the intensive requirements of overall study design.

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Questions and Comments