# Effect of Utilizing a Sleep Guidline on Sleep Pattern among Third Trimester Pregnant Women

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*Abstract:* The aim of this study was to evaluat the effect of utilizing guideline on sleep pattern in third trimester pregnant women. A Quasi-Experimentaldesign wasutilaized. This study was conducted at the Antenatal clinic at the Obstetrics and Gynecology center in Mansura city over a period of eight months from the beginning of July 2016 to the end of Feb 2016. A purposive sample was used to select the study (n=80). Two tools were used for data collection; the first tool wasa Structured Interview schedule. It consisted of four parts to measure the following items; general characteristics, the past and present reproductive history, the minor discomforts during third trimester and daily lifestyle of the subject. Tool two was Pittsburgh Sleep Quality Index (PSQI). The PSQI is composed of 19 items that are used to assessthe sleep quality. Findings: According to Pittsburgh Sleep Quality Index (PSQI) there was a highly statistically significant difference in subjects' sleep patterns between pre and post-interventionscors. However, their utilization of sleep medication was almost the same before and after the intervention. The findings of this study suggested a statistically significant improvement in the subjects sleep pattern after implementation of the guideline in comparison to before. Recommendations: Simple handouts as booklets and brochures about sleeping pattern and its importance should be prepared and distributed at antenatal clinics. Sleep guidelines should be integrated into maternity courses curriculum for nursing students. Sleep enhancing educational session should be applied at the maternity hospitals and centers.

*Keywords:* Pregnancy, sleep, sleep disturbance, sleep pattern, sleeping quality, third trimester.

## I. INTRODUCTION

Sleep is an essential component of well being, where its timing, duration and quality are critical determinants of health. Insufficient sleep has major health consequences in adults, adolescent, and young children, even the fetus intrauterine is affected by insufficient or disturbed sleep of their mothers *(Perry et al., 2013; Radford, 2017).*According to *Egypt Demographic Health Survey (2014)* Childbearing begins early for many Egyptian women. Where more than one quarter of women at age 25-49 had their first birth by age 20, and 45 percent gave birth by age 22. As much as 7% of adolescents are already mothers, and 4% are pregnant with their first child. TheAmerican Academy of Pediatric has recognized insufficient sleep in adolescence as an important public health issue that significantly affects health and safety of their

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teens. Sleep deprivation started at adolescence. Since adolescent today is the future adult, future women, and future mothers *(Sheldon, 2015)*.

During pregnancy sleep demands put an extra load on women's body, and if not managed properly it will lead to a series of complications for both mothers and their fetus *(Akhter, 2016)*.WHO recommendations on antenatal care confirmed that improving pregnant women's sleeping pattern is considered one of the preventive measures during antenatal care *(WHO, 2016)*.*Reichner (2015)*reported that, Insomnia and sleep deficiency during pregnancy are very common among most women. Inaddition sleep disturbancesget more common as pregnancy progresses, possibly related to pregnancy-related physical symptoms or discomforts.

There is an increasing evidence indicating that sleep problems may be associated with adverse maternal and fetal outcomes such as depressive symptoms, increased pain during labor, more Caesarean sections, preterm birth, and low birth weight *Reichner (2015)*. *Rezaei et al. (2015)*declared that around three quarters of women experience sleep disturbance in pregnancy.Sleep disorders before, during, and after childbirth may be aggravated by neglecting health behavior. Health behavior education might be useful for the management of depression in pregnant women. Maternity nurse plays an important role in antenatal care specially in managing sleep disturbance. This role includes; relevant assessment, planning, implementation and evaluation of care provided. They teach the expectant mothers how to control and deal with disturbed sleep, and improve their sleeping pattern.

**Significance of the study:**

Several researches had confirmed that around three quarters of women suffering from sleep disorders during pregnancy. In this regards *Yan (2017)*had reported that 78% of the pregnant women suffering from sleep disturbance at some point of their pregnancy, *Kay-Stacey and Attarian (2017)*also added that 76% of the women experience poor quality sleep. In addition *Nierenberg (2017)*, had clarified that his studied women report that the overall quality of their sleep was not good. They have more trouble falling asleep, and the number of their nighttime and early morning awakenings increase compared with mid-pregnancy. Moreover, A lot of women say they have bizarre dreams related to their baby during pregnancy that makes their sleep disturbed *(Kay-Stacey & Attarian, 2017; Nierenberg, 2017; Yan, 2017)*.

Good sleep is an essential component to health and wellbeing. It consumes one third of human existence, unhealthy sleep can severely impair the other two-thirds. An increasing amount of data now shows that poor sleep such as sleep disordered breathing, poor sleep quality, and insomnia has a negative impact on pregnancy outcomes. Indeed, over half of the most important risk factors for stillbirth, such as maternal hypertension, gestational diabetes, and fetal growth restriction, have been shown to be associated with maternal sleep disruption *(O'Brien & Warland, 2014)*.

Despite strong evidence of the relationship between insufficient sleep and health problems, most women are unaware of the amount of sleep they need, their level of sleep deprivation, and the negative impact of sleep deprivation on health and becomes worse. Because of lack of awareness, sleep is not commonly incorporated into public health approaches. In addition sleeping problems is marginalized research phenomen*(Sigurdson & Ayas, 2007; Wilson et al., 2018)*

The maternity nurse has a great role in managing sleep disturbance at antenatal care clinics by planning and implementing several approaches to reduce the public health burden of insufficient sleep through increasing public awareness of the importance of sleep and improving diagnosis and treatment of sleep disorders, so this study is very important to overcome sleep problem. Few studies in Egypt have focused on the effect of sleep guideline on sleeping pattern of the pregnant women, in this regards *Zaky (2015)* studied the relationship between quality of sleep during pregnancy and birth outcome among primiparae in Alexandria, Egypt and reported a significant relation between sleeping quality and birth outcomes, therefore this study conducted to evaluate the effect of guideline to improve sleep pattern among pregnant women in third trimester.

**Aim of the study:**

The aim of this study is to evaluat the effect of utilizing guideline on sleep pattern on third trimester pregnant women.

**Research hypotheses:**

Pregnant women who utilize sleep guidline the sleep pattern among them improve than the pregnant women who don't utilize.

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## II. SUBJECTS AND METHOD

**Study Design:**

A Quasi-Experimental research design was utilized.

**Study setting:**

This study was conducted at the Antenatal clinic at the Obstetrics and Gynecology center in Mansura city.

**Subjects of the study:**

The study sample consisted of eighty pregnant women who attended the Antenatal clinic of Obstetrics and Gynecology center. Theywere selected according to the following inclusion criteria.

**Inclusion Criteria:**

∗ Pregnant women in third trimester ,gestational age from 28 weeks -40 weeks.

∗ Maternal age between 18-35 years.

∗ Single uncomplicated pregnancy.

∗ Free from any medical and obstetrical diseases.

∗ Attends regular antenatal follows up.

∗ Able to read and write.

∗ Accept to participate in the study.

**Sample type:**

A Purposive sample of eighty pregnant women were recruited from the previous mentioned setting to the inclusion criteria.

**Sample size:**

The study includes eighty pregnant women. Sample sizewas calculated according to the following formula: Concealing prevalence of poor sleep quality 39% *(Facco et al., 2010)*and expecting to be 29% and using **stat calc** sample size calculation at 5%αerror (95% significance) and 20%βerror (80% power of the study) We add 5% for incomplete data so the sample size will be 80 pregnant women in third trimester.

**Tools of data collection:**

**Tool I: A Structured Interviewschedule:**

It was designed by the researcher after reviewing the related literature. It consisted of four parts to assess the following:

*Part1*: It included subjects' general characteristics *includes* (Age, height, weight, educational level, occupation, residence, income, marital status, and telephone number)**.**

*Part 2:* It contained their past and present reproductive history *includes* (gravidity, parity, gestational age, number of miscarriages, and number of follow-up visits).

*Part 3:* It entailed their minor discomforts during third trimester *includes* (fatigue, insomnia, shortness of breathing anddspnea,fantiness, bachache, Urgency/frequency of urination, edema, constipation, leucorrhoea, leg cramps, hemorrhoids, heartburn, abdominal gases, nausea and vomiting, varicosities).

*Part 4:* It was used to assess daily life style of pregnant women *includes* (food, drink, complementary supplement, exercise, smoking, and drugs).

**Tool II: Pittsburgh Sleep Quality Index (PSQI)**

It was originally adopted from*(Buyss, 1989)*, to measure sleep quality during the previous month and to discriminate between good and poor sleepers. It is composed of 19 items that are combined to form 7 (components), each of them has a

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range of 0-3 points. In all cases, score of (0) indicates no difficulty; while a score of (3) indicates severe difficulty. The 7 component scores are then added to yield one (global) score, with a range of (0-21) points, (0) indicates no difficulty and (21) indicate severe difficulty in all areas.

Minimum score=0(better); maximum score=21(worse)

Interpretation:

Total ≤ 5 associated with good sleep quality.

Total > 5 associated with poor sleep quality.

**Method:**

**The Pilot Study:**

Pilot study was carried outatthe Antenatal clinic in the Obstetrics and Gynecology center in Mansura city 10% of the sample size (eight pregnant women) to test the applicability and relevance of the research tools and the clarity of the designed questionnaire and the required modification were made. The pilot sample was excluded from the study.

**Validity of tools:**

Tool's content validity was tested by a panel of three expertise in the field. According to panel'ssuggestions the tools were modified.

**Reliability:**

Reliability of tools was testedthrough Cronbach's α (alpha) technique. Reliability for tool II: PSQI questionnaire had an internal consistency reliability estimate was 89.3%. and hence the questionnaire was found to be highly reliable.

**Field Work:**

The study was carried out in a period of eight months from the beginning of July 2016 to the end of September 2016 to collect the data required for assessment of sleep pattern.

The researcher had obtained the approval from research ethical committee of the Faculty Nursing in Mansoura University and from the director ofAntenatal clinic at the Obstetrics and Gynecology center.

The researcher visitedthe antenatal clinic ofobstetrics and Gynecology Hospital three days per week from 9 am – 1 pm.She introduced herself to each pregnant women recruited each interview lasted for 20-25 minutes.During the interview, the researcher read every item of the data collection sheet and clarified its meaning to the woman, and utilizing pre intervention (daily life style, and minor discomfort, Pittsburgh Sleep Quality Index (PSQI))to assess sleep pattern, Women were permitted to ask for any interpretation, elaboration or explanation.

Researcher collected data regarding general characteristics, andreproductive data to assess sleep pattern. The researcher was clarified components for each woman of sleep guideline which includes: (get regular, sleep when you sleepy, get up and try again, etc.).After that the researcher was provide each woman one hard copy of sleep guideline to follow it and instructed her how to apply guideline.Then the researcher was check schedule visit card to determine the time after month to evaluate the effect of the guideline implement on sleep pattern quality and informing each woman if she has any questions call the researcher telephone to answer them about.

Then, after the implementation of sleep guideline woman by one month each woman was followed up to assess her sleep pattern quality by using (PSQI). The researcher hadutilizing post intervention (daily life style, and minor discomfort, Pittsburgh Sleep Quality Index (PSQI))to assess sleep pattern.

**Statistical analysis:**

The collected data were coded, computed and analyzed statistically utilizing SPSS (Statistical Package of Social Sciences) version 20.0 (SPSS Inc., Chicago, IL, USA).All data were categorical data and were expressed in number and percentage. The differences between two groups or more were determined using chi-square test. The Cronbach's alpha is used to assess the reliability (or internal consistency) of a set of components of the PSQI. Statistical significance was set at $p<0.05$.

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**Ethical consideration:**

- Ethical approval was attained from research ethics committee of the Nursing Faculty, Mansoura University.

- An ethical approval was taken from the physicians of antenatal clinic of Mansoura University Hospital of obstetrics and Gynecology to obtain the official permission to conduct the study after explaining the aim of the study.

- Written informed consents were obtained from every pregnant women involved in the study and after clarification of the nature objective of the study.

- The participants were reassured about the Anonymity, privacy, safety and confidentiality of the collected information throughout the whole study.

- The participants were informed about their rights to refuse participation or withdraw from the study at any time.

## III. RESULTS

Table (1) reveales that 56.3% of the subject aged 24 to 29 years oldand 55.0% of them were overweight. Nearly one-half(51.3%) of them were secondary school graduate, as much as 78.8% were housewife. The majority(78.8%) of them were from rural area, and 92.5% had adequate monthly income and all women were currently married.

Table (2) showes that 91.3% of the participants got pregnant 1 to 3 times,It also showed that 57% were multipara and 82.5% had no previous history of abortions. About three-fifths (61.2%) of them had gestational age of 28th to 32nd weeks, and 58.8% reported more than eight antenatal visits.

Table (3) showesa highly statistical significant difference between pre and post-intervention all aspects of sleep pattern (p <0.001) except use sleep medications where p =0.080.

Table (4) revealesa statistically significant association between sleep quality and Body Mass Index (BMI), where p<0.001. On the other hand, no statistically significant association was found between sleep quality and the age of the pregnant women, occupational status, residence nor family income.

Table (5) showesthat there was statistically significant association between sleep quality and antenatal follow up visits (p=0.004). On the other hand, no association was observed between the sleep quality and the gravidity, parity or abortion post-intervention.

**Table 1: General Characteristics of the study subjects**

|  | No.=80 | % |
|---|---|---|
| **Age** | | |
| 18-<24 years | 19 | 23.8 |
| 24-<30 years | 45 | 56.3 |
| ≥30years | 16 | 20.0 |
| Mean ±SD | 26.5 ±4.5 | |
| **Body mass index (BMI)** | | |
| Normal | 15 | 18.8 |
| Overweight | 44 | 55.0 |
| Obese | 21 | 26.3 |
| Mean ±SD | 27.9 ±2.9 | |
| **Educational level** | | |
| Read and write | 4 | 5.0 |
| Primary | 9 | 11.3 |
| Secondary | 41 | 51.3 |
| Higher | 26 | 32.5 |
| **Occupation** | | |
| Housewife | 63 | 78.8 |
| Employed | 17 | 21.3 |
| **Residence** | | |

| | | |
|---|---|---|
| Rural | 57 | 71.3 |
| Urban | 23 | 28.8 |
| **Family income** | | |
| Inadequate | 6 | 7.5 |
| Adequate | 74 | 92.5 |

**Table 2: Frequency Distribution of the Pregnant Women According to Reproductive History**

| | No.=80 | % |
|---|---|---|
| **Gravida** | | |
| 1 – 3 | 73 | 91.3 |
| ≥4 | 7 | 8.7 |
| **Parity** | | |
| Nullipara | 34 | 42.5 |
| Multipara | 46 | 57.5 |
| **Abortion** | | |
| None | 66 | 82.5 |
| 1 – 3 | 14 | 17.5 |
| **Gestational age** | | |
| 28 – 32 weeks | 49 | 61.2 |
| ≥ 33 weeks | 31 | 38.8 |
| Mean ±SD | 31.8 ±2.4 | |
| **Antenatal follow up visits** | | |
| 1 – 8 | 33 | 41.3 |
| >8 | 47 | 58.8 |
| Mean ±SD | 8.2 ±2.9 | |

**Table 3: Sleep Pattern Pre- and Post-Intervention Among the study subjects according to Pittsburgh Sleep Quality Index (PSQI)**

| | Pre-intervention | | Post-intervention | | Chi square test | |
|---|---|---|---|---|---|---|
| | No.=80 | % | No.=80 | % | $X^2$ | P |
| **Subjective sleep quality** | | | | | | |
| Very good | 13 | 16.2 | 36 | 45.0 | | |
| Fairly good | 1 | 1.2 | 40 | 50.0 | | |
| Fairly bad | 29 | 36.2 | 4 | 5.0 | | |
| Very bad | 37 | 46.2 | 0 | 0.0 | 103.833 | <0.001 |
| **Sleep latency** | | | | | | |
| Score 0 | 6 | 7.5 | 4 | 5.0 | | |
| Score 1 | 7 | 8.8 | 57 | 71.2 | | |
| Score 2 | 43 | 53.8 | 19 | 23.8 | | |
| Score 3 | 24 | 30.0 | 0 | 0.0 | 72.753 | <0.001 |
| **Sleep duration** | | | | | | |
| >7 hours | 13 | 16.2 | 12 | 15.0 | | |
| 6 – 7 hours | 1 | 1.2 | 68 | 85.0 | | |
| 5 – 6 hours | 22 | 27.5 | 0 | 0.0 | | |
| <5 hours | 44 | 55.0 | 0 | 0.0 | 131.099 | <0.001 |
| **Sleep efficiency** | | | | | | |
| >85 | 7 | 8.8 | 30 | 37.5 | | |
| 75 – 84 | 4 | 5.0 | 41 | 51.2 | | |
| 65 – 74 | 24 | 30.0 | 7 | 8.8 | | |
| <65 | 45 | 56.2 | 2 | 2.5 | 93.383 | <0.001 |

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| Sleep disturbance | | | | | | |
|---|---|---|---|---|---|---|
| Score 0 | 0 | 0 | 2 | 2.5 | | |
| Score 1 | 0 | 0 | 49 | 61.2 | | |
| Score 2 | 50 | 62.5 | 29 | 36.2 | | |
| Score 3 | 30 | 37.5 | 0 | 0.0 | 86.582 | <0.001 |
| **Use sleep medication** | | | | | | |
| Not used during past month | 77 | 96.2 | 80 | 100 | | |
| Used less than once a week | 3 | 3.8 | 0 | 0.0 | 3.057 | 0.080 |
| **Daytime dysfunction** | | | | | | |
| Score 0 | 0 | 0.0 | 8 | 10.0 | | |
| Score 1 | 15 | 18.8 | 52 | 65.0 | | |
| Score 2 | 38 | 47.5 | 20 | 25.0 | | |
| Score 3 | 27 | 33.8 | 0 | 0.0 | 61.019 | <0.001 |
| **Total sleep quality score** | | | | | | |
| Good ($\leq$5) | 13 | 16.2 | 49 | 61.2 | | |
| Bad (>5) | 67 | 83.8 | 31 | 38.8 | 34.128 | <0.001 |
| **Total PSQI** | | | | | | |
| o Range | 4 – 17 | | 3 – 10 | | | |
| Mean ±SD | 13.3 ±4.1 | | 5.9 ±1.8 | | 14.689* | <0.001 |

*\* t value, Student's t test*

**Table 4: The Association Between the Sleep Quality and the General Characteristics of the study subjects**

| | Sleep Quality Pre | | | | | Sleep Quality Post | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Good (No.=13) | | Bad (No.=67) | | | Good (No.=49) | | Bad (No.=31) | | |
| | N | % | N | % | Chi square test | N | % | n | % | Chi square test |
| **Age** | | | | | | | | | | |
| 18-< 24 years | 6 | 46.2 | 13 | 19.4 | | 15 | 30.6 | 4 | 12.9 | |
| 24-< 30 years | 5 | 38.5 | 40 | 59.7 | $X^2$=4.319 | 27 | 55.1 | 18 | 58.1 | $X^2$=4.601 |
| $\geq$30years | 2 | 15.4 | 14 | 20.9 | P=0.115 | 7 | 14.3 | 9 | 29.0 | P=0.100 |
| **Body mass index (BMI)** | | | | | | | | | | |
| Normal | 7 | 53.8 | 8 | 11.9 | | 13 | 26.5 | 2 | 6.5 | |
| Overweight | 3 | 23.1 | 41 | 61.2 | $X^2$=13.133 | 21 | 42.9 | 23 | 74.2 | $X^2$=8.389 |
| Obese | 3 | 23.1 | 18 | 26.9 | P<0.001 | 15 | 30.6 | 6 | 19.4 | P=0.015 |
| **Educational level** | | | | | | | | | | |
| Read / write | 2 | 15.4 | 2 | 3.0 | | 2 | 4.1 | 2 | 6.5 | |
| Primary | 2 | 15.4 | 7 | 10.4 | | 8 | 16.3 | 1 | 3.2 | $X^2$=3.376 |
| Secondary | 5 | 38.5 | 36 | 53.7 | $X^2$=4.093 | 24 | 49.0 | 17 | 54.8 | P=0.337 |
| High | 4 | 30.8 | 22 | 32.8 | P=0.252 | 15 | 30.6 | 11 | 35.5 | |
| **Occupation** | | | | | | | | | | |
| Housewife | 9 | 69.2 | 54 | 80.6 | $X^2$=0.841 | 36 | 73.5 | 27 | 87.1 | $X^2$=2.107 |
| Employed | 4 | 30.8 | 13 | 19.4 | P=0.359 | 13 | 26.5 | 4 | 12.9 | P=0.147 |
| **Residence** | | | | | | | | | | |
| Rural | 10 | 76.9 | 47 | 70.1 | $X^2$=0.244 | 34 | 69.4 | 23 | 74.2 | $X^2$=0.214 |
| Urban | 3 | 23.1 | 20 | 29.9 | P=0.621 | 15 | 30.6 | 8 | 25.8 | P=0.644 |
| **Family income** | | | | | | | | | | |
| Inadequate | 2 | 15.4 | 4 | 6.0 | $X^2$=1.391 | 5 | 10.2 | 1 | 3.2 | $X^2$=1.333 |
| Adequate | 11 | 84.6 | 63 | 94.0 | P=0.238 | 44 | 89.8 | 30 | 96.8 | P=0.248 |

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**Table 5: The Association Between the Sleep Quality and the Table 5. The Association Between the Sleep Quality Reproductive History of the study subjects**

| | Sleep Quality Pre | | | | | Sleep Quality Post | | | | |
| | Good (No.=13) | | Bad (No.=67) | | Chi square test | Good (No.=49) | | Bad (No.=31) | | Chi square test |
| | N | % | N | % | | N | % | n | % | |
| **Gravida** | | | | | | | | | | |
| 1 – 3 | 11 | 84.6 | 62 | 92.5 | $X^2$=0.856 | 44 | 89.8 | 29 | 93.5 | $X^2$=0.335 |
| ≥4 | 2 | 15.4 | 5 | 7.5 | P=0.355 | 5 | 10.2 | 2 | 6.5 | P=0.563 |
| **Parity** | | | | | | | | | | |
| Nullipara | 4 | 30.8 | 30 | 44.8 | $X^2$=0.874 | 19 | 38.8 | 15 | 48.4 | $X^2$=0.718 |
| Multipara | 9 | 69.2 | 37 | 55.2 | P=0.350 | 30 | 61.2 | 16 | 51.6 | P=0.397 |
| **Abortion** | | | | | | | | | | |
| None | 10 | 76.9 | 56 | 83.6 | $X^2$=0.334 | 38 | 77.6 | 28 | 90.3 | $X^2$=2.145 |
| 1 – 3 | 3 | 23.1 | 11 | 16.4 | P=0.563 | 11 | 22.4 | 3 | 9.7 | P=0.143 |
| **Gestational age** | | | | | | | | | | |
| 28 – 32 weeks | 7 | 53.8 | 42 | 62.7 | $X^2$=0.359 | 25 | 51.0 | 24 | 77.4 | $X^2$=5.575 |
| ≥ 33 weeks | 6 | 46.2 | 25 | 37.3 | P=0.549 | 24 | 49.0 | 7 | 22.6 | P=0.018 |
| **Antenatal follow up visits** | | | | | | | | | | |
| 1 – 8 | 3 | 23.1 | 30 | 44.8 | $X^2$=2.115 | 14 | 28.6 | 19 | 61.3 | $X^2$=8.388 |
| >8 | 10 | 76.9 | 37 | 55.2 | P=0.146 | 35 | 71.4 | 12 | 38.7 | P=0.004 |

## IV.  DISCUSSION

The current study aimed evaluat the effect of utilizing guideline on sleep pattern on third trimester pregnant women. The findings of this study revealed a statistically significant improvement in the subjects sleep after implementation of the guideline in comparison to before.

The effect of sleep guideline in the current study indicates that the findings of the current study was consistent with *Kempler et al. (2012)* who had used a booklet discussing the issue of sleep among 214 first time mothers during their last trimester of their pregnancy and found a significant relation between his control and study groups regarding sleeping habits after using the booklet.

As regards toPittsburgh Sleep Quality Index, the results showed highly statistical significant difference between pre and post-intervention of all sleep pattern (p <0.001) except use of sleep medications as p =0.080, where the minority of the women used sleep medications. This results may be attributed to pregnant women's fear from congenital malformation that may occurred if they use such medication, these findings were supported by *Okun et al. (2015)* who had studiedsleep-promoting medications use in pregnancy and stated that overall, the examined studies showed no correlation of increased risk of congenital malformations, however, some medications may increase rates of preterm birth, low birth weight, and/or small-for-gestational-age infants.

According to the result of the current study showed a statistically significant association between sleep qualityand body mass index (p<0.001). This  result is agreement with *Vargas et al. (2014)* who found that sleep disturbance during pregnancy may be attributed to obesity and overweight. It was noticed that obesity and overweight are considered as the main causes of different health problems that characterized by chronicity, additionally a lot of researches shed the light on the relationship between sleep disturbance and non-communicable diseases. *Kovacs and Briggs (2015)* in their book entitled Lectures in Obstetrics, Gynaecology and Women's Health had suggested that weight control will benefit the client from two dimension; decreasing the consequences of non-communicable diseases and managing sleep disorders. Since obesity and weight variation plays a vital role in women's life it is highly important to tackle by the guideline, which was made by the current study guideline.

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The current study revealed a statistically significant association between sleep quality and compliance with antenatal follow up visits (p=0.004) . This finding may be attributed to the benefits gained from antenatal care and early detection of any problem and the effect of antenatal health classes and teaching provided for the pregnant women which gives more attention to women's nutrition and life style modification concerning rest, sleep and exercises *(Cunningham et al., 2014).*

Accurate and proper assessment for sleeping pattern during pregnancy considered as a milestone for developing a successful plan of care. Guided care is essential for the nurse, so they can adequately support the mothers and help them to get safer pregnancy. Obstetrics and gynecological nurse have multidimensional role, since they act as a care giver who responsible to provide a well-designed sleep environment, they act as sleep enhancer when dealing with critical case who are have sleep deprivation, they also act as a health educator who give a planned health education session related to sleeping problems among the expected mother*(Wilkinson & Treas, 2014)*.

## V. CONCLUSION

**This study concluded that:**

Applying a sleep guideline was an effective method to improve sleep pattern among pregnant women. According to Pittsburgh Sleep Quality Index (PSQI) there was a highly statistical significant difference between pre and post-intervention of sleep patterns among the studied women except use of sleep medications.

The findings of this study indicated that, there was statistically significant improvement in the women sleep after implementation of the guideline in comparison to before.

The study hypothesis was accepted and it indicates that the guideline was effective.

## VI. RECOMMENDATIONS

**Based on the findings of this study the researcher recommended the following:**

1. Sleep guideline handouts as booklets and brochures about sleeping pattern and its importance should be developed and distributed at antenatal clinics.

2. Evidence-based sleep guidelines should be integrated in maternity courses curriculum for nursing students.

3. Using Pittsburgh Sleep Quality Index (PSQI) at antenatal clinics in order to assess sleep quality is recommended.

4. Sleep enhancing educational session should be applied at the maternity hospitals and centers.

**Further researches are proposed to:**

1. Pattern of sleep among mother with preterm babies: a retrospective study.

2. The relationship between pregnant women sleeping pattern and labor outcome.

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