

# Assessment of Maternal Sleeping Habits and Knowledge among Pakistani Pregnant Women

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## ABSTRACT

**Introduction:** The sleeping position of pregnant women can influence the outcome of their pregnancy, leading to an increased risk of stillbirth, low birth weight, and other adverse fetal outcomes. Sleeping in the supine position is associated with negative effects, while the ideal maternal sleeping position is sleeping on the left lateral side. Pregnant women should be made aware of this so they can make an informed decision to change their sleeping habits.

**Aim:** To assess the current knowledge possessed by Pakistani pregnant women on the effects of maternal sleeping positions, and determines their maternal sleeping habits.

**Materials and methods:** This cross-sectional study included 300 pregnant women that were visiting the outpatient department of Gynaecology, Hamdard University, Karachi, Pakistan. They were asked to fill out a questionnaire regarding demographics, pregnancy, sleep advice, and sleep habits. The data was analyzed using IBM Statistical Package for Social Sciences (SPSS) software, version 26. Pearson's, Chi-squared, and Fisher's exact tests were used to compare gestational age with advice about sleeping positions, and parity with advice about sleeping positions, respectively. A *p*-value of below 0.05 was considered significant.

**Results:** 22 (7.3%) women in our study reported sleeping in the supine position. 58.7% of women reported not receiving advice on sleep positions by anyone, and only 7.0% said they were advised by a doctor. Gestational age above and below 25 weeks was associated with receiving advice about sleeping positions (*p* = 0.043). Multiparity was also found to have an association with having received advice on sleeping positions (*p* < 0.001).

**Conclusion:** Women should be made aware of the effects of sleep positions by doctors so they can modify their sleep habits accordingly.

**Clinical significance:** A decrease in supine sleep and an increase in left-sided sleep position, in early and late pregnancy, may contribute to a reduction in adverse pregnancy outcomes.

**Keywords:** Adverse pregnancy outcomes, Left lateral position, Maternal sleep positions, Sleep disorders, Sleeping habits, Supine position.

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## INTRODUCTION

In recent times, there has been a great deal of research on the correlation between maternal sleep positions and adverse pregnancy outcomes.<sup>1-3</sup> Maternal sleep position, especially sleeping in the supine position, is known to be associated with adverse outcomes for the baby, such as low birth weight,<sup>4</sup> admission to the neonatal intensive care unit,<sup>4</sup> and stillbirth.<sup>1,3-5</sup> It has also been documented that uterine blood flow decreases during supine rest and exercise,<sup>6,7</sup> and the gravid uterus compresses the inferior *vena cava* when the mother is lying on her back.<sup>8,9</sup> Given that maternal sleep position is a modifiable risk factor,<sup>4,5,10</sup> doctors must advise mothers about proper sleep positions<sup>11</sup> that are safe and comfortable for both the mother and the baby.

In Pakistan, there is a lack of data regarding the extent of pregnant women's knowledge on this matter, the sleeping positions routinely used by them during pregnancy, and what is being advised by doctors. A meta-analysis found only two studies have been carried out in low- and middle-income countries assessing the sleeping positions of pregnant women, in India and Ghana, respectively.<sup>12</sup> Therefore, there was a need to fill the gap in the literature by conducting a study; the objectives of our study included assessing the current level of knowledge possessed by pregnant women of Pakistan on the effects of maternal sleeping positions, and determining their sleeping habits.

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## MATERIALS AND METHODS

This cross-sectional study was conducted at Hamdard University Hospital. Hamdard University Hospital is a 300 bedded tertiary care hospital in Karachi that sees patients from all over Pakistan. Pregnant women visiting the gynae outpatient department were prospectively recruited from March 2021 to February 2022. They were included in the study with their informed consent and asked to fill out a questionnaire. The exclusion criteria were pregnant patients who had reported having depression or any other mental

**Table 1: Demographics (N = 300)**

	Frequency	%
<b>Ethnicity</b>		
Urdu-speaking	231	77.0
Sindhi	38	12.7
Punjabi	29	9.7
Others	2	0.7
<b>Educational level</b>		
Did not attend school	4	1.3
Secondary/class 10	6	2.0
A level/inter/high school	210	70.0
University	80	26.7
<b>Socioeconomic status</b>		
Working class	4	1.3
Middle class	290	96.7
Upper class	6	2.0
<b>Multiparity</b>		
Women with 1 child or none	198	66.0
Women with more than one child	102	34.0
<b>Gestational age</b>		
Gestational age below 25 weeks	164	54.7
Gestational age above 25 weeks	136	45.3
<b>Age</b>		
Women between 20 years and 25 years	102	34.0
Women between 25 years and 30 years	179	59.7
Women >30 years	19	6.3

**Table 2: Sleeping habits of women (N = 300)**

	Frequency	%
<b>Who advised you about sleep positions during pregnancy?</b>		
Was not advised	176	58.7
Parents	10	3.3
Doctor	21	7.0
Internet	35	11.7
Prior knowledge	58	19.3
<b>Usual going to sleep position</b>		
Either side	94	31.3
Right side	77	25.7
Left side	107	35.7
Supine	22	
<b>Reason for usual going to sleep position</b>		
Comfortable	149	49.7
Easier to get to sleep	73	24.3
Easier to get in or out of bed	33	11.0
Relieves back pain	7	2.3
Relieves heartburn	8	2.7
Helps with breathing	9	3.0
Other reason	21	7.0
<b>Where do you place pillows at night?</b>		
Under the head	253	84.3
Supporting abdomen	33	11.0
Behind back	13	4.3
Body pillow	1	0.3
<b>Do you snore at night?</b>		
No	149	49.7
Yes	26	8.7
Unsure	125	41.7
<b>Do you feel well-rested after a night's rest?</b>		
No	146	48.7
Yes	154	51.3
<b>How many hours do you usually sleep at night?</b>		
<4 hours	3	1.0
From 4 to 5 hours	31	10.3
From 6 to 7 hours	110	36.7
>7 hours	156	52.0

health issue and those who were unable to give consent. After the application of the inclusion and exclusion criteria, the total number of participants in the study was 300. Ethical approval was taken from the institutional review board before administering the questionnaire.

The questionnaire included a section on demographics, pregnancy, sleep advice, and sleep habits. The participants were asked details pertaining to their pregnancy in the questionnaire, including their gravida, parity, body mass index, last menstrual period, estimated delivery date, gestational age, and whether or not they had gotten a dating scan.

We used several questions to assess maternal sleep variables such as the size of their bed<sup>13</sup> (categorized as queen, king, single, double, or sleep on the floor); bed-sharing with other people; children sleeping in bed with them; the side of the bed they sleep on; if they have received any advice on sleep positions and if yes, then from whom; whether they are aware of better maternal sleep positions; most common sleep position they use, and why. The sleep positions were classified as prone (on your stomach), supine (on your back), sitting/propped up, left side (left lateral), right side (right lateral), or either side.<sup>5</sup> Along with these, they were asked if they are willing to change their sleep positions upon finding out it is better for the baby.

Participants were further asked about the placement of pillows at night, snoring at night, the number of hours they usually sleep at night, and if they feel well rested after a night's sleep. Sleep duration was categorized as below 4 hours; 4–5 hours; 6–7 hours; and above 7 hours.

**Statistical Analysis**

The data were analyzed using the software IBM SPSS software, version 26. Descriptive statistics were calculated in the form of frequency and percentage, which were then used to compare the data. Demographic data such as age, ethnicity, and educational level were analyzed (Table 1). Questions assessing women's sleeping habits were analyzed as well (Table 2). Fisher's Exact Test was used to compare gestational age and parity with advice about sleeping position, and the results were reported (Tables 3 and 4). With our sample size (n = 300), a p-value below 0.05 was considered statistically significant.



**Table 3:** Multiparous women and if they received advice on sleeping positions

	Advice received		Fisher's exact test
	No	Yes	$p > 0.001$
Women with 0 or 1 child	166	32	
Women with more than one child	16	86	

**Table 4:** Gestational age of women and if they received advice on sleeping positions

	Advice received		Pearson's Chi-squared test
	No	Yes	$p = 0.043^a$
Gestational age below 25 weeks	108	56	
Gestational age above 25 weeks	74	62	

<sup>a</sup>Statistical significance level of 0.05

## RESULTS

Out of the 300 total participants, 231 women (77.0%) were Urdu-speaking, 210 (70.0%) had been educated up to high school or inter-level, and 102 women (34.0%) were multiparous. The demographic results of the study participants are given in Table 1.

Results of women's sleeping habits are shown in Table 2. A total of 176 (58.7%) of the women reported not having been advised on proper sleep positions, and only 21 (7.0%) said they had been advised by a doctor (Table 2). None of the women in our study reported sleeping prone or sitting up positions. A total of 22 (7.3%) women in our study reported sleeping in the supine position; 296 (98.7%) women stated their bed size to be double and 4 (1.3%) disclosed sleeping on the floor. A total of 273 (91.0%) women shared their beds with other people, and the remaining 27 (9.0%) did not. A total of 195 (65.0%) did not have children sleeping in their beds, and 105 (35%) did have children sleeping in their beds.

The number of women reporting that they felt well-rested after a night's sleep was 154, and the rest of the 146 did not feel well-rested. A total of 8.7% of women reported snoring at night, while 41.7% were unsure of their snoring (Table 2).

Gestational age above and below 25 weeks was compared with receiving advice about sleeping positions and our results found an association, with  $p = 0.043$  (Table 4). Fisher's exact test was used to compare multiparity with having received advice on sleeping positions and found an association with  $p < 0.001$  (Table 3).

## DISCUSSION

As previously mentioned, pregnant females sleeping in the supine position are associated with adverse pregnancy outcomes.<sup>1-6,8</sup> A total of 22 (7.3%) women included in our study slept in the supine position; 35.7% slept on the left side, and 31.3% slept on either side (Table 2). These results of ours are similar to a study from Cronin et al., where only 3% of the women slept supine, 30% slept on their left side, and 39% slept on either side.<sup>13</sup>

Unfortunately, only 7.0% of women in our study reported having received advice from doctors about better sleeping positions (Table 2). More than half were not advised by anyone whatsoever, the rest reported either having prior knowledge and experience, being advised by family members, or having received guidance from the internet. Some of the women who were more aware of better sleeping positions during pregnancy, chose

the "other" option when asked about the reason for their most common sleep position, and wrote as "better for the baby." The results of our study further add that having more than one child was associated with having received advice on sleeping positions ( $p < 0.001$ ). These findings (Table 3) suggest that multiparous women, having had the experience of previous pregnancies and being able to seek more knowledge about correct pregnancy practices, are more educated about better maternal sleep positions compared to nulliparous women. This data indicates a serious dearth of awareness surrounding the topic of maternal sleep positions, particularly in women with 1 child or less, and strongly suggests that advice regarding these sleep positions should make up part of a gynecologist's consultation.

When we asked the participants of the present study if they would change sleeping positions if they found out it would be better for their baby, all of them stated that they would. This compliance is also found in the aforementioned Cronin et al. study, in which, 263 (69.8%) women out of a sample size of 377, did not sleep on their left side; and 227 out of those 263 women (86.3%) stated that they would switch to sleeping on their left side if this was better for their baby.<sup>13</sup> In another study in New Zealand, two-thirds of the women who received advice about sleeping on their sides after a public health campaign in the country were able to follow it.<sup>14</sup>

The preceding evidence postulates that if women were given the opportunity to make an informed decision on their sleep positions during pregnancy, they would comply with the medical advice that is best for their baby's health.

Going to sleep in the supine position during pregnancy was associated with a 3.7 fold increase in the risk of stillbirth in one study,<sup>5</sup> and a 2.3 fold increase in another.<sup>5</sup> The findings of a study carried out by Milsom et al. on an equal number of primigravid and multigravida women ( $n = 20$ ), during the last trimester of their pregnancies, including significant decreases in cardiac output ( $p < 0.001$ ) and stroke volume ( $p < 0.001$ ) in each of the supine, right lateral and lithotomy positions, as compared to the left lateral position. The diastolic, systolic, and mean arterial blood pressures and total peripheral vascular resistance were found to be significantly ( $p < 0.001$ ) increased in the supine, right lateral, and lithotomy positions as well when compared to the left lateral position; the percentage increase in systolic blood pressure between left lateral and supine position was 13% and the increase in diastolic pressure was 32%.<sup>15</sup> Ueland et al. also had similar results of reduced cardiac output in the supine position during gestation.<sup>16</sup> It is an easily modifiable risk factor, and so it can be argued that it should just as easily be relayed to patients. This adds emphasis to the notion that public health awareness programs, intervention methods by medical professionals, and campaigns should be introduced. Informing women of the potential benefits and health risks of specific maternal sleep positions that are supported by research should be done in order to reduce maternal, fetal, and neonatal complications.<sup>3-5,15</sup>

In some patients, it has been reported that the supine sleep position is also associated with increased severity of sleep-disordered breathing (SDB), which includes snoring and obstructive sleep apnea.<sup>17-20</sup> Sleep-disordered breathing during gestation can increase the risk of a myriad of negative pregnancy outcomes, such as gestational diabetes,<sup>22-26</sup> gestational hypertension/preeclampsia,<sup>21-24,26,27</sup> preterm delivery,<sup>2,4,26,27</sup> cesarean sections,<sup>23,27</sup> low birth weight,<sup>24,27</sup> small for gestational age (SGA),<sup>27</sup> and intensive care unit admissions.<sup>22</sup>

In our study, 26 out of 300 women (8.7%) self-reported snoring, while 125 (41.7%) of them were not sure whether they snored or not. Sleep apnea increases sleep arousals and awakenings, resulting in sleep fragmentation, 11 which can precipitate poor sleep quality and sleep deficiency. Poor sleep quality, in both early and late pregnancy, was associated with an increased risk of delivering preterm.<sup>28,29</sup>

Pregnant women getting less than six hours of sleep at night was also linked to adverse pregnancy outcomes.<sup>5</sup> Sleep deprivation during gestation was linked with preterm birth, longer labor, higher cesarean rates, and postpartum depressive mood.<sup>29,30</sup> The data from a prospective observational study carried out by Lee and Gay, showed that pregnant women that slept less than 6 hours per night during the last month of their pregnancy, had longer labor hours and a 4.5 increased risk of cesarean sections compared to women that slept above 6 hours per night.<sup>31</sup>

In our study, 34 (11.3%) women reported sleeping less than 6 hours. In a different study, 77.9% of the women reported some sort of sleep problem during pregnancy.<sup>32</sup> According to our data findings, 48.7% of women in our study did not feel well rested after a night's sleep, even though more than half (52.0%, 156/300) of the total participants usually slept above 7 hours at night. This may possibly be accredited to physiological changes in the body during pregnancy, as well as sleep variables such as SDB and maternal sleeping positions.<sup>10</sup>

Taking into account the above-stated, it seems imperative that doctors should screen pregnant women for sleeping habits and advise them accordingly during their early consultations, in order to avoid antepartum and postpartum health hazards to both the mother and her baby. Pregnant women should be made aware of maternal practices that are the most beneficial for fetal outcomes so that they are able to consciously choose what to integrate into their lifestyle.

## LIMITATIONS

The limitations of the study include a small sample size and a single-center design. The majority of the women in this study were of one ethnicity, and larger studies with more diverse ethnic groups are needed.

## CONCLUSION

The majority (58.7%) of the women in our study did not receive any sleep advice regarding the effects of different maternal sleep positions. Gestational age above and below 25 weeks, and having more than one child were found to have significant ( $p = 0.043$  and  $p < 0.001$ , respectively) independent associations with having received advice on sleeping positions. Sleeping in the supine position is one of the sleeping habits that can cause adverse pregnancy outcomes. In order to tackle these risks, women should be able to access research-backed advice about their health and be made aware of the effects of sleep positions to modify their sleep habits accordingly.

## CLINICAL SIGNIFICANCE

It is possible that a decrease in supine sleep and an increase in left-sided sleep position, in early and late pregnancy, may contribute to a reduction in adverse pregnancy outcomes. Hence, counseling women and giving them educated autonomy over their sleep decisions is of clinical significance.

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