



## SLEEP DISORDERS IN IRANIAN PREGNANT WOMEN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Conflicts of Interest: Nil

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### ABSTRACT

**Aim:** The aim of this systematic review and the meta-analysis was to evaluate the Sleep Disorders in Iranian pregnant women.

**Methods:** The proposed protocol and the methods used in this systematic study were developed based on the Cochrane Handbook for Systematic Reviews of Interventions and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Observational studies conducted on the general population are attached and studies on specific populations (acute conditions, home care centers) were excluded.

**Results:** According to the results of the randomized method (95% CI), the overall sleep disorders prevalence rate among 996 persons was 80.8% (95% CI 78.2%-82.9%),  $I^2 = 97$ .

**Conclusion:** Since sleep disorders in individuals are likely to bring about not only undesirable health and social effects (through influencing the individual's performance in fulfilling occupational and familial duties) but also impose huge medical and caring costs that will ultimately result in unfavorable economic effects in the society. Thus, through conducting studies on understanding the effective factors, it is possible to prevent and treat these disorders and inhibit the possible consequences of such disorders.

**Key words:** Sleep Disorder, Pregnancy, Labor

### INTRODUCTION

Pregnancy is associated with numerous physiological and hormonal changes that are likely to affect the sleep structure (1). Reduced sleep quality is one of the major complaints made by pregnant women especially during the third trimester (2).

As a natural process at some points of women's lives, pregnancy is associated with remarkable mental and physical changes (3). Lack of knowledge about these changes and the proper methods of dealing with possible problems caused by these changes are likely to bring about injuries the effects of which affect mothers even many years after the delivery (4).

The Sleep disorder is the most common problem of pregnancy (5). From week 12 of pregnancy to 2 months after birth, women complain about falling asleep late, frequent wake-ups, insomnia, and reduced sleep quality (6). Moreover, some physical, mental, and emotional factors are likely to disrupt the sleep pattern and cause sleep disorders (7). Hormonal changes such as increased estrogen and progesterone as well as increased plasma cortisol affect the natural sleep as well (8). Given the limitations existing in evaluations and studies, the factors affecting the sleep disorder during pregnancy are not accurately known (9). Thus,

there are contradictory reports on the incidence and accurate nature of sleep disorder during pregnancy (10).

Insomnia is known as one of the most significant sleep disorders and a threatening phenomenon for health (11). Insomnia is created in response to external or internal stimuli (12). Insomnia is likely to result in physical and psychological symptoms (13). Sleep disorders can also affect the individual performance, mental exhaustion, memory problems, lack of focus, perception changes, and disorder in one's judgment (14).

### Methods

#### Enrollment and Inclusion Criteria

The proposed protocol and the methods used in this systematic study were developed based on the Cochrane Handbook for Systematic Reviews of Interventions and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Observational studies conducted on the general population are attached and studies on specific populations (acute conditions, home care centers) were excluded. The results were formulated as reported in the study. The minimum sample size was 25 patients per study. The target population was the entire Iranian pregnant women.

International databases (PubMed, Google Scholar, WOS, and Scopus) and national databases (SID, MAGIRAN) and national publications were reviewed to find similar studies without language and regional constraints from September 1 to 30, 2019. The MEDLINE research strategy was used to search for other databases. Specific research strategies were developed by the Health Sciences Library specializing in systematic reviews based on the Peer Review of Electronic Search Strategies (PRESS). Also, PROSPERO was used for ongoing and recently completed systematic reviews. Boolean operator (AND, OR, and NOT), Medical Subject Headings (MeSH), cut "\*", and related textual words were used to search for titles and abstracts with the following keywords: Sleep Disorder, Pregnancy, Labor, and IRAN.

### Research Selection and Data Extraction

According to the research protocol, two researchers separately reviewed the research titles and abstracts based on the inclusion criteria. In the next step, after excluding repeated studies, the full manuscripts of the studies were reviewed according to the inclusion criteria and the required data and information were extracted. The consensus method was used to resolve differences and inconsistencies between the two researchers. The data extracted included general information (first author, year, and place), research characteristics (the research design, the sample size, location, study period, and bias risk), and output (prevalence) calculations.

### Quality Assessment

To assess the quality of the methodology and the bias risk, each observational study was evaluated using the instrument developed by Hoy et al. This

10-item instrument assessed the quality of the study in two dimensions, including external validity (items 1 to 4 assessed the target population, the sampling frame, the sampling method, and the minimum indirect neglect) and internal validity (items 5 to 9 assessed the methods of data collection, case definitions, instruments, and data collection modes, and item 10 evaluated the analysis-related bias). The bias risk was assessed separately by two researchers and any inconsistency was resolved by consensus.

### Data Synthesis

All studies that met the inclusion criteria were synthesized after a systematic evaluation. The data were combined with the accumulation graph. The random-effects model was evaluated based on the overall quality of life. The heterogeneity of the initial studies was assessed by  $I^2$  tests. The subgroup analysis was performed to determine heterogeneity based on gender and age. The meta-analysis was performed using STATA14 software (STATA CORP, COLLEGE STATION, TX, USA).

## Results

### General Findings

#### Research Selection

In the initial review, 187 articles were selected from different databases. Of the 801 non-useful studies identified in the review of titles and abstracts, 764 articles were deleted because they had inappropriate titles. Of the 37 studies, 6 met the inclusion criteria. Of the 87 excluded studies, 12 were revision studies, 3 letter to editor, and 72 articles did not meet the minimum requirements to be included in the review (Fig. 1).

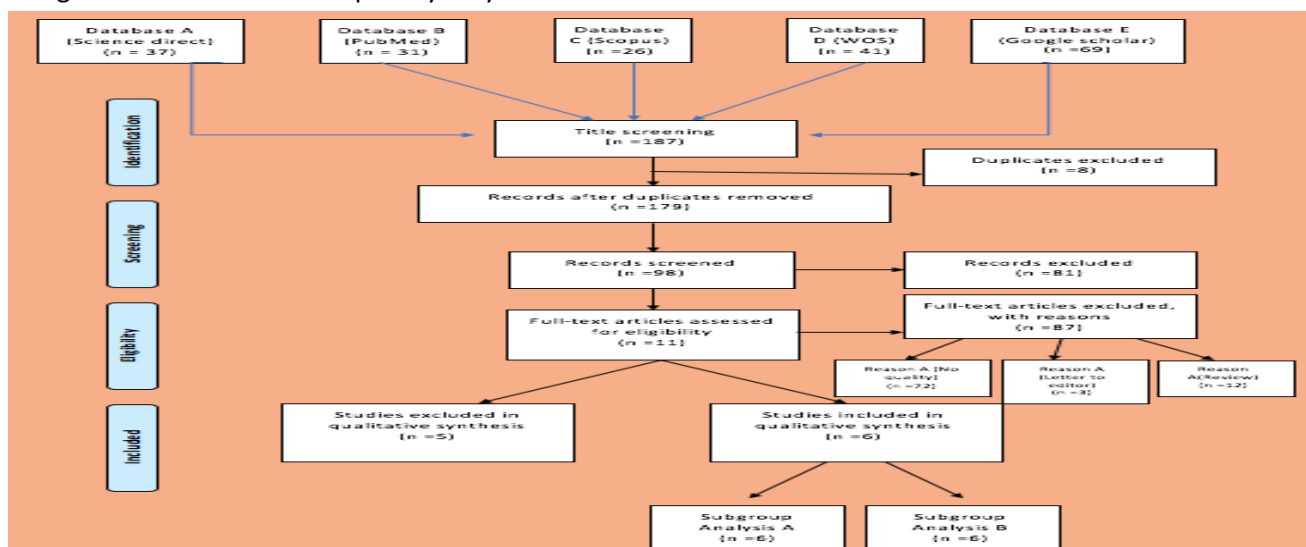


Fig 1: PRISMA flow diagram

### Research Characteristics

The study was conducted on 996 participants. Their ages ranged from 17 to 45 years. All 6 included studies had cross-sectional data. 6 studies were selected from 5 provinces (2 studies from Karaj ). The most frequently used sampling method was multistage random sampling (N = 4). All studies had a low bias risk. (Table 1).

### Main Results

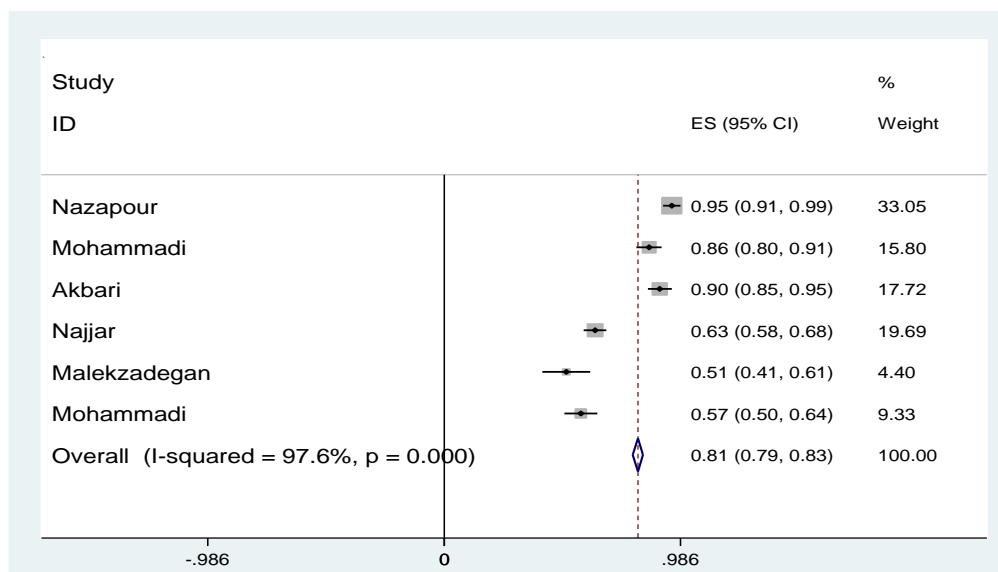
According to the results of the randomized method (95% CI), the overall sleep disorders prevalence rate among 996 persons was 80.8% (95% CI 78.2%-82.9%),  $I^2 = 97.6$  (Fig. 2).

**Table 1: Characteristics of final included studies about Sleep Disorders in Iranian pregnant women**

	First author	Publication year	Participants	Mean age	prevalence	provience
1	Nazapour	2007	151	23.9	95%	Tehran
2	Mohammadi	20014	171	29.5	85.5%	Karaj
3	Akbari	2007	139	23.15	90%	Saghez
4	Najjar	2017	400	26	63%	Dezfoul
5	Malekzadegan	2010	95	-----	51.1%	Zanjan
6	Mohammadi	2014	200	----	57%	Karaj

**Table 2: Sleep Disorders in Iranian pregnant women**

Study	Publication year	ES	95% conf. Interval		Weight
			Low	Up	
Nazapour <sup>17</sup>	2007	0.950	0.914	0.986	<b>33.05</b>
Mohammadi <sup>18</sup>	2014	0.855	0.802	0.908	<b>15.80</b>
Akbari <sup>19</sup>	2007	0.900	0.850	0.950	<b>17.72</b>
Najjar <sup>20</sup>	2017	0.630	0.583	0.677	<b>19.69</b>
Malekzadegan <sup>21</sup>	2010	0.510	0.410	0.610	<b>4.40</b>
Mohammadi <sup>22</sup>	2014	0.570	0.501	0.639	<b>9.33</b>
Pooled ES	-----	0.808	0.787	0.829	<b>100</b>



**Fig 2:** The prevalence of Sleep Disorders in Iranian pregnant women and its 95% interval for the studied cases according to the year and the city where the study was conducted based on the model of the random effects model. The midpoint of each section of the line estimates the % value and the length of the lines showing the 95% confidence interval in each study.

## Discussion

According to the results of the randomized method (95% CI), the overall sleep disorders prevalence rate among 996 persons was 80.8%(95% CI 78.2%-82.9%),  $I^2 = 97.6$ . Sleep is one of the basic needs of humans, and having a proper sleep is essential for feeling happy and alert during the day (15). Pregnancy is the time for emotional, physiological, and physical changes in women. Most of these changes, being normal parts of natural process of pregnancy, can cause physical problems affecting the women's emotional and psychological perspective (16). Women are dealing with serious problems in achieving deep and non-interrupted sleep especially in the third trimester. According to the international classifications of sleep disorders, increased sleeping time and drowsiness in the day are clearly observed in the first trimester (17). Moreover, frequent wake-ups and reduced sleep quality are observed at the end of pregnancy. The main factors affecting sleep disorders include increased sized of uterus, the individual's inability to sleep, frequent urination increased heart rate, shortness of breath, leg cramp, low back pain, heartburn, constipation, general feeling of sickness, fetal movements, and nightmares (18).

The changes made in women's sleeping quality in the third trimester bring about anxiety, depression, reduced tolerance against pain, reduced control over one's feelings, long delivery, increased possibility of Caesarean section, and postpartum depression.

Although sleep disorders in the third trimester can result in unfavorable effects on both fetal and maternal health, they have not been given due attention.

Since sleep disorders in individuals are likely to bring about not only undesirable health and social effects (through influencing the individual's performance in fulfilling occupational and familial duties) but also impose huge medical and caring costs that will ultimately result in unfavorable economic effects in the society. Thus, through conducting studies on understanding the effective factors, it is possible to prevent and treat these disorders and inhibit the possible consequences of such disorders (13).

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