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Original Article

Investigation of the Prevalence of Back Pain and Related Risk Factors in Different Trimesters of Pregnancy in Pregnant Women Referring to Selected Health Centers in Shahrekord, Iran, During 2022-2023

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Abstract

Background and aims: Back pain is one of the most common and often neglected problems in pregnancy. This study aimed to investigate the prevalence of back pain and its associated risk factors during the trimesters of pregnancy in pregnant women referring to selected healthcare centers in Shahrekord from 2022 to 2023.

Methods: This cross-sectional study was conducted on 521 eligible pregnant women referring to selected holistic healthcare centers in Shahrekord, Iran, during 2022-2023. Data were collected using a demographic characteristics checklist completed as a self-report, and the presence of back pain was evaluated based on the perception and feeling that the mother herself had of any pain in the lower back area. The data were analyzed using SPSS (version 26), and $P<0.05$ was considered the significance level.

Results: The prevalence of back pain in pregnant women was 62.7% in general, with a significant difference among trimesters of pregnancy ($P<0.001$). Among the investigated risk factors, there was a significant association between employment ($P=0.01$), type of delivery ($P=0.002$), type of anesthesia ($P<0.001$), history of back pain before pregnancy ($P<0.001$), and standing break of more than three hours ($P<0.001$) and the prevalence of back pain. In addition, increasing gestational age ($P<0.001$, odds ratio = 1.308, 95% confidence interval = 1.255–1.363) was a significant predictor of back pain in pregnancy.

Conclusion: The results revealed that more than half of women experience back pain during pregnancy, and the most powerful factor in the prevalence of this disorder is increasing gestational age. Considering the high prevalence and effects of pain on the quality of life of pregnant women, it is important for service providers to identify and develop policies and design effective interventions to prevent or solve this problem.

Keywords: Low back pain, Pregnancy, Prevalence, Risk factors

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Introduction

Back pain is one of the most common health issues among women worldwide,[1] and pregnancy is one condition that predisposes women to back pain.[2] Low back pain is between the 12th rib and the gluteal fold.[3] The prevalence of back pain during pregnancy varies in different regions and has been reported to range from 24% to 90%.[1,3,4] Back pain usually starts between the fifth and seventh months of pregnancy.[5] In a study in Iran, a significant difference was observed in the prevalence of back pain in the trimesters of pregnancy, and most complaints of back pain were reported in the third trimester.[6]

Although back pain in pregnancy is not life-threatening,[3] it can cause moderate to severe disability,[7] affect daily activities such as walking, working, mood, and even sleep, and lead to a decrease in quality of life and satisfaction during pregnancy.[7,8] There is a direct correlation between the duration of back pain in pregnancy and poor work performance, the duration of absenteeism, and physical dysfunction.[9] The importance of this disorder is so great that 19% of women who experience back pain during pregnancy avoid pregnancy.[8] In addition, disability and adverse psychological effects related to back pain have been reported in many countries.[3,8] Further,

many pregnant women do not report their back pain to healthcare service providers and attribute it to pregnancy; as a result, this disorder in pregnancy may be ignored.[8] Therefore, healthcare workers must acquire clinical skills to diagnose and deal with back pain in early pregnancy to improve outcomes.[8]

The primary etiology of back pain is unclear, and its risk factors are varied in different reports, and there is no consensus about them.[2,10] However, various factors, such as hormonal causes, especially relaxin due to increased pelvic laxity,[6] mechanical causes such as frequent bending during the day, heavy workload, parity, difficult birth experience, history of pelvic trauma, multiple births, weight gain, obesity, body mass index, history of back pain, aging, and depression have been raised in this respect.[1,3] The most common known risk factors are a history of back pain from a previous pregnancy and chronic back pain.[11]

The available data regarding the prevalence of back pain and its risk factors during pregnancy in Iran are highly limited. In the study by Ghaderi et al, back pain was reported to be the most common musculoskeletal pain in pregnancy.[12] Another study by Mohseni-Bandpei et al in northern Iran showed that there was a significant association between the history of back pain and prolonged standing. The occurrence of back pain in pregnancy, gestational age, and duration of standing breaks were also reported to be significant factors for the occurrence of back pain.[13] Lack of awareness of such common musculoskeletal complaints can lead to poor management of women in pregnancy.[3] Therefore, proper knowledge of back pain, its prevalence in pregnancy, and predisposing factors are important and can lead to preventive strategies and appropriate interventions for optimal outcomes.[1] Social attitudes, race, and cultural beliefs may influence how pregnancy affects back pain.[14] Climatic and nutritional conditions are also effective factors in back pain.[1] Most of the research on back pain has been performed in developed countries, and this issue has been partly neglected in developing countries.[15] Shahrekord is a unique region in terms of climate, and no study has yet been conducted on the prevalence and risk factors of back pain during pregnancy in this city. Accordingly, the present study aimed to determine the prevalence of back pain and its related risk factors during different trimesters of pregnancy in pregnant women referring to selected healthcare centers in Shahrekord from 2022 to 2023.

Materials and Methods

Type of Study and Study Population

This cross-sectional study was conducted on pregnant women referring to selected holistic healthcare centers across Shahrekord during 2022-2023.

Sample Size and Sampling Method

This study was performed on 521 pregnant women. The centers were selected using cluster sampling, and six were randomly selected using convenient sampling. The inclusion criteria included volunteering to participate in the study, being literate and having a natural pregnancy based on the diagnosis of a gynecologist, no history of surgery or fracture in the lumbar vertebrae, no lumbar tumors, no lumbar disc herniation, no trauma, no inflammatory or rheumatic disease involving the back, no spinal deformities, and no osteoporosis.

Outcome Evaluation and Data Collection Methods

After obtaining written consent, the demographic information checklist, including age, education level, occupation, gestational age, parity, type of delivery and type of anesthesia in a previous delivery, history of back pain before pregnancy, smoking, and standing breaks of more than three hours per day, was completed by the participants. Back pain was assessed based on the respondent's understanding and feeling of pain in the lower back as a two-mode variable (having or not having back pain).[7]

Analysis Method

The obtained data were analyzed using SPSS, version 26. Descriptive statistics, the chi-square test, and Fisher's exact test were used to determine the frequency and mean values and investigate the association between the variables, respectively. $P<0.05$ was considered the significance level.

Results

The present study was performed on 521 pregnant women. Three hundred twenty-seven (62.8%) of participants reported experiencing back pain, of which 294 (56.4%) mentioned that they had had back pain before pregnancy.

The participants ranged from 17 to 44 years old, and their mean age was 28.92 ± 5.92 years. Among the participants, 135 (25.9%) individuals had no history of childbirth (nulliparous). Out of the 386 pregnant women who had a history of childbirth, 130 (33.6%) had a history of cesarean delivery. Other demographic variables are presented in Table 1.

The data on the association between demographic variables and back pain in pregnancy are provided in Table 1. The results showed a significant association between the occupation of pregnant women, the history of childbirth by natural delivery or cesarean section, the type of anesthesia, the history of back pain, and the prevalence of back pain during pregnancy ($P<0.05$).

In addition, among 327 pregnant women with back pain, 166 (50.7%) had standing breaks of more than three hours per day. There was a significant association between the duration of standing breaks per day and the prevalence of back pain during pregnancy ($P<0.001$).

On the other hand, there was no significant difference in the prevalence of back pain between nulliparous and multiparous women ($P=0.19$).

In addition, 148 (28.4%), 142 (27.3%), and 231

Table 1. Association Between Demographic Variables and Back Pain in Pregnancy

Variable		With Back Pain No. (%)	Without Back Pain No. (%)	Total No. (%)		*P* Value
Age (y)	Under 20	22 (81.48)	5 (18.52)	27 (100)	521 (100)	0.1[a]
	20-35	253 (61.25)	160 (38.75)	413 (100)		
	Over 35	52 (64.19)	29 (35.81)	81 (100)		
Education level	Illiterate	0 (0)	2 (100)	2 (100)	521 (100)	0.05[a]
	Elementary	13 (52)	12 (48)	25 (100)		
	Secondary	40 (76.92)	12 (23.08)	52 (100)		
	Diploma	103 (62.04)	63 (37.96)	166 (100)		
	Academic	171 (61.95)	105 (38.05)	276 (100)		
ccupation	Housewife	212 (60.39)	139 (39.61)	351 (100)	521 (100)	0.01[a]
	Clerk	70 (61.94)	43 (38.06)	113 (100)		
	Healthcare staff	30 (90.90)	3 (9.1)	33 (100)		
	Self-employed	11 (61.11)	7 (38.89)	18 (100)		
	Other	4 (66.66)	2 (33.34)	6 (100)		
Parity	Nulliparous	80 (59.2)	55 (40.8)	135 (100)	521 (100)	0.19[a]
	Multiparous	247 (64)	139 (36)	386 (100)		
Type of delivery	Natural	179 (69.92)	77 (30.08)	256 (100)	386 (74,01)	0.002[a]
	Cesarean	68 (52.31)	62 (47.69)	130 (100)		
Type of anesthesia	Local	42 (44.68)	52 (55.32)	94 (100)	117 (22,45)	<0.001[b]
	General	20 (86.95)	3 (13.05)	23 (100)		
History of back pain before pregnancy	Yes	139 (47.27)	155 (52.73)	294 (100)	521 (100)	<0.001[b]
	No	188 (82.81)	39 (17.19)	227 (100)		
Duration of standing break (h)	Under 3	161 (100)	0 (0)	161 (100)	521 (100)	<0.001[b]
	Over 3	166 (46.11)	194 (53.89)	360 (100)		
Smoking	Yes	21 (52.5)	19 (47.5)	40 (100)	521 (100)	0.11[a]
	No	306 (63.61)	175 (36.39)	481 (100)		

[a] Chi-square test; [b] Fisher's exact test.

(44.3%) pregnant women were in the first, second, and third trimesters of pregnancy, respectively. The results demonstrated that 17 out of 148 pregnant women in the first trimester, 86 out of 142 pregnant women in the second trimester, and 224 out of 231 pregnant women in the third trimester had back pain, and the most complaints due to back pain were reported in the third trimester. There was a significant difference between the prevalence of back pain in trimesters of pregnancy ($P > 0.001$, Table 2).

In the present study, using a logistic regression test and controlling for the influential underlying variables, including type of delivery, type of anesthesia, history of back pain before pregnancy, and duration of standing break, it was determined whether increasing gestational age ($P > 0.001$, odds ratio = 1.308, 95% confidence interval = 1.255–1.363) could cause back pain in pregnancy (Table 3).

Discussion

A pregnant woman undergoes many anatomical and physiological changes during pregnancy. These changes affect the skeletal-muscular system and lead to pain and discomfort in the lower back.[2] This study was conducted on 521 pregnant women in different trimesters of pregnancy to investigate the prevalence of back pain in pregnancy and related risk factors. Among the investigated risk factors, there was a significant association between education, employment, gestational age, type of delivery, anesthesia method, history of back pain before pregnancy, and the duration of a standing break of more than three hours with the frequency of back pain.

Our study and other studies showed that back pain is a common disorder (62.8%) in pregnant women in Shahrekord, within the range of prevalence reported worldwide.[1,4,9,10] In the population of African women, the prevalence of back pain was 62%,[2] 50% in Norwegian pregnant women,[16] and 66.9% in Iranian women,[6] while in Nepal, the prevalence of back pain was reported to be 34%.[3] The difference in the reported prevalence may be because pain is a subjective feeling, and socio-cultural conditions are among other factors that affect how a woman understands and copes with back pain during pregnancy.[1] Furthermore, the prevalence rate may be affected by the data collection method and the characteristics of the participants.[12]

The results of this study revealed that back pain can occur in any trimester of pregnancy. However, the highest prevalence of back pain was reported in the third trimester, and in the second trimester, it was higher than the first trimester, which is in line with the findings of

Table 2. Frequency of Back Pain in Different Trimesters of Pregnancy

Gestational Age (wk)	With Back Pain No. (%)	Without Back Pain No. (%)	Total No. (%)		*P* Value
First trimester (week 1-14)	17 (11.4)	131 (88.6)	148 (100)		
Second trimester (week 15-28)	86 (60.5)	56 (39.5)	142 (100)	521 (100)	<0.001
Third trimester (week 29-42)	224 (96.9)	7 (3.1)	231 (100)		
Total	327 (62.7)	194 (37.3)	521 (100)		

Table 3. Examining Effective Factors on Back Pain in Pregnancy (Logistic Regression Analysis)

Effective Factors		*P*-value	Non-Adjusted Odds Ratio	Confidence of 95%	Adjusted Odds Ratio	Confidence of 95%
Gestational age (week)		>0.001	1.308	1.255–1.363	1.311	1.191–1.444
Natural Cesarean	Type of delivery	0.922	0.83	0.65–1.05	0.97	0.60–1.57
Local General	Type of anesthesia	0.955	1.13	0.31–4.01	1.04	0.25–4.25
History of back pain before pregnancy	Yes No	0.726	0.99	0.99–1.000	1.0	0.99–1.001
Duration of standing break (hours)	Under 3 Over 3	0.987	0.72	0.19–2.263	0.98	0.15–6.25

Manyozo et al,[2] Carvalho et al,[17] Omoke et al,[1] and Rabiee and Sarchamiee.[6] Moreover, a significant difference was observed in the prevalence of back pain among different trimesters of pregnancy, which conforms to the results of Rabiee and Sarchamiee.[6] Increasing gestational age increases the risk of back pain, which aligns with the findings of other studies.[18-20] These observations can be caused by changes in the musculoskeletal system, including postural changes, increased load on the spine due to fetal growth, and severe lordosis, leading to pressure on the joints of the spine and dysfunction.[21,22] The important point is that the high prevalence of back pain in the third trimester can be attributed to false labor at the end of pregnancy, so it is suggested that future studies focus on investigating the prevalence of back pain before the beginning of false labor and at different times of pregnancy.

In the present study, about three-quarters of the women were multiparous, and almost a quarter were nulliparous, with no significant association between parity and back pain. Nonetheless, in the study by Shijagurumayum et al, most of the investigated women were nulliparous.[3] The mean gestational age of the investigated women was 24 weeks, which was similar to the studies of Shijagurumayum et al[3] and Ghaderi et al.[12] Most of the intended women were in the third trimester, which conforms to the findings of Gutke et al,[8] Mens et al,[23] Kovacs et al,[18] and Rabiee and Sarchamiee,[6] while in the study of Shijagurumayum et al, most of the women were in the first trimester.[3] A significant association was observed between the mother's age and back pain, which matches the results of Rabiee and Sarchamiee[6] and Goli et al[24] and is probably due to the lower pain tolerance threshold in younger women.[6]

The average age of our participants was 28.9 years, which was highly close to the average age of women in the studies of Rabiee and Sarchamiee[6] and Ghaderi et al.[12] There was no significant association between the mother's age and back pain, which corroborates with the findings of Orvieto et al,[25] Fast et al,[26] and Ghaderi et al[12] while contradicting those of Rabiee and Sarchamiee,[6] Mohseni-Bandpei et al,[13] and Stapleton et al.[27] Perhaps the reason for this difference is that most of the women in the present study were multiparous and in a higher age range than the above-cited studies. The pain tolerance threshold is likely higher in these women than in the others. Younger age has been reported as a risk factor for back pain in some studies, perhaps because younger women are probably more predisposed to hormonal changes and have looser collagens; therefore, the prevalence of back pain is higher in them.[13,28]

A significant association was found between employment and back pain, which is in line with the findings of Ghaderi et al[12] and Garshasbi and Faghih Zadeh.[29] However, it does not match the findings of Rabiee and Sarchamiee.[6] In fact, in women whose jobs require standing for a long time, the probability of back pain prevalence is higher,[29] and performing activities and standing for long periods effectively aggravates back pain.[12]

A significant association was reported between education level and back pain, which aligns with the results of Shijagurumayum et al[3] while being contrary to those of Omoke et al.[1] In the present study, women had lower education levels than women in other studies, which can be one of the reasons for the higher back pain reported by them because it has already been observed that education level is related to the severity of symptoms.[3] The lower level of information about common pregnancy-related problems due to lower education can explain this association.[30]

In some studies, such as the present study, there was no association between parity and back pain,[6,12,26-28,31] while in others, a significant association was found between these variables.[25,26,32,33] The inconsistent results regarding the association between parity and back pain may be due to the difference in the average parity in different studies.

The type of previous delivery had a significant association

with back pain, which is in line with the findings of Breen et al[34] while being contrary to the findings of MacArthur et al,[35] Rabiee and Sarchamiee,[6] Goli et al,[24] and Ghaderi et al.[12] A significant difference was noticed between the history of receiving general and epidural anesthesia in people with a history of cesarean section, in such a way that back pain was reported at a higher rate in women receiving epidural anesthesia, which is in contradiction with the findings of Rabiee and Sarchamiee[6] and Abbasi et al.[36] Perhaps one of the reasons for the inconsistency of the findings is that women receiving epidurals expected more back pain than other people, so they reflected it more. However, to draw correct conclusions, factors such as the type of anesthetic agent, the type of anesthetic agent injected into the epidural space, the volume used, and the addition of adrenaline to the anesthetic agent should be taken into consideration.[13] In addition, it should be noted that factors such as the degree of the block, the movement of the subepidural hematoma, the formation of blood clots in the epidural space, and minor skin hematomas are among the risk factors for back pain related to epidural anesthesia.[37]

In this study, a standing break of more than three hours was significantly associated with back pain, which is in conformity with the results of Rabiee and Sarchamiee[6] and Hollisaz et al.[38] More clearly speaking, when pregnant women stand, the center of gravity of the body changes and the curvature of the spine increases, resulting in more pressure on the waist and the pelvic girdle, ligaments, and joints.[38] Fatigue from standing for a long time may also contribute to back pain. In contrast, in a review study investigating back pain in pregnancy, no significant association was reported between standing breaks and back pain.[13]

The history of back pain increases the probability of developing back pain in the current pregnancy,[12] which conforms to the results of the present study. More than half of the women in the present study reported a history of back pain before pregnancy, which aligns with the findings of Mens et al.[23] In contrast, in the study of Rabiee and Sarchamiee, only a quarter of the women reported a history of back pain, and most of them had back pain during their recent pregnancy.[6] Many women attribute the cause of their chronic back pain to pregnancy.[6] A significant association was observed between the history of back pain before pregnancy and back pain during pregnancy, which is in line with the results of other studies.[6,11,12] The history of back pain is affected by mechanical, genetic, and environmental factors, all of which intensify during pregnancy following physiological changes in the body.[12]

The current study reported a significant association between exercise during pregnancy and before pregnancy and back pain, which is in conformity with the findings of studies conducted on the effect of different types of exercise in pregnancy by reducing the amount of back pain.[39,40] However, it is in contrast with the results of Rabiee and Sarchamiee,[6] Mohseni-Bandpei et al,[13] and Sedighi et al.[32] The reason for this difference is likely that the number of people who exercised in our study was higher than in the above-mentioned studies.

The findings of the present study demonstrated that back pain was a common disorder in pregnant women in Shahrekord, and the most critical risk factor was gestational age, which increased the likelihood of back pain. In developing countries such as Iran, back pain during pregnancy may be ignored and is considered a common complaint.[15]

Limitations and Strengths of the Study

One of the limitations of the present study is related to generalizing the findings to other regions because it only includes the women who are referred to prenatal clinics. Additionally, the results may have been affected since the back pain in people was examined as a self-report.

On the other hand, one of the strengths of the current research is that, to the best of our knowledge, no such study has yet been conducted in Shahrekord and Iran. Research with this purpose, especially during the trimesters of pregnancy, is scarce. This study was conducted on 521 pregnant women, which is an acceptable sample size.

Conclusion

Back pain is a common disorder during pregnancy among women in Shahrekord. Standing breaks of more than 3 hours a day, an interval of less than three years between pregnancies, a history of back pain before pregnancy, employment, education level, the type of delivery, and the type of anesthesia used in the previous birth were significant risk factors for back pain in pregnancy, and the most important factor was gestational age. The results of the present study support the salience of identifying and paying attention to back pain in pregnancy by healthcare service providers and evaluating it in prenatal visits to prevent long-term complications through providing timely information and treatment.

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Authors' Contribution

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Competing Interests

None.

Ethical Approval

This study was approved by the Ethics Committee of the Shahrekord University of Medical Sciences (IR.SKUMS.REC.1401.159). All the questionnaires were completed after obtaining written consent to participate in the study from potential participants, ensuring the confidentiality of the information and the lack of a change in service provision in the event of a lack of voluntary participation in the study.

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