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Low back pain in a sample of Syrian pregnant women: A cross-sectional study

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Abstract

Introduction: Low back pain related to pregnancy occurs in 60%–70% of pregnancies, at any time during pregnancy. During pregnancy, many factors such as weight gain, and others are the causes of the back pain. In Syria, due to the circumstances of the war, many pregnant women may be exposed to increase the risk of lower back pain, so this study will determine the prevalence of lower back pain among pregnant women and its potential risk factors. We aimed to evaluate the prevalence of low back pain in pregnant women and to assess the risk factors related to it.

Methods: A cross-sectional, observational study was conducted between May 2020 and December 2022 at Obstetrics and Gynecology University Hospital in Damascus, Syria. Pregnant women aged over 18 years were selected from the outpatient clinic. Participants, after signing the informed consent, fill out the survey, which included the following parameters: age, weight, height, body mass index (BMI), education, parity, shoe type, weekly walking hours, occupation, low back pain, in which semester, radiation, onset, alleviating and aggravating factors, disability, and pain in previous pregnancies. We used Excel 2010, and the Statistical Package for the Social Sciences version 23.0. $p < 0.05$ was considered statistically significant, and we used the Chi-square test (χ^2 test), t student test to test the basal differences between groups.

Results: A number of 551 pregnant participants were included and low back pain prevalence was 62%. There was a statistically significant relation between low back pain and each of the following: Obesity, weekly walking hours, pain in previous pregnancies, and occupation.

Conclusion: Low back pain is prevalent during pregnancy and the most important risk factors include obesity and pain in previous pregnancies whereas walking and employment are protective measures to prevent low back pain.

KEYWORDS
low back pain, obesity, pregnancy, walking

1 | INTRODUCTION

Low back pain related to pregnancy occurs in 60%–70% of pregnancies.[1] It can begin at any time during pregnancy but in a higher prevalence during the third trimester.[2] Although in most cases, it is mild, severe pain is found in one-third of the cases.[3] The pain is worse in the evening, and in 67% of cases, it will be at night. Although it will disappear within 3 months, 7%–8% of the patients will have chronic pain.[4–6] Pain is aggravated by many factors such as standing, walking, sitting, sneezing or coughing, and straining during a bowel movement.[7]

During pregnancy, weight gain, posture changes, as pregnancy shifts your center of gravity, hormone changes, muscle separation, the ligaments which naturally become softer and stretch to prepare for labor, and stress are the causes of back pain. Mechanical instability in the lumbar spine and pelvis commonly causes lower back pain in pregnant women. The compensatory lumber lordosis causes excess strain on the muscles, lumbar joints, and ligaments. Hormonal changes in pregnancy loosen the joints and relax the ligaments that attach the pelvic bones to the spine, which leads to less stability and causes pain when walking, standing, sitting for long periods, bending, or lifting things.[8–12]

Risk factors of pregnancy-related low back pain included: The presence of previous low back pain, the presence of previous pregnancy-related low back pain, and laborious work.[13]

It is characterized as a dull pain, more pronounced in flexion, and exacerbated by spinal muscle palpation. It can be localized or spread to the thighs and less frequently to the lower abdomen.[14–16]

In Syria, due to the circumstances of the war, such as the husband's abandonment, or displacement from one region to another, prolonged standing—carrying or dragging a weight, and dependence on excess carbohydrate intake in food, many pregnant women may be exposed to increase the risk of lower back pain, so this study will determine the prevalence of lower back pain among pregnant women and its potential risk factors, which may provide a direct benefit to the possibility of preventing it.

2 | PATIENTS AND METHODS

An observational, cross-sectional study between May 2020 and December 2021 enrolled a sample of pregnant women>18 years old, who were referred to the out hospital-clinics in the University Obstetrics and Gynecology Hospital in Damascus, Syria. The research approval (CV 3443) was given by the Ethics Committee of the Faculty of Medicine, Damascus University, Syria.

The sample size was 313 participants depending on the Open Epi site,[17] with a confidence interval of 95%. Every participant has signed the informed consent. Low back pain related to pregnancy is defined as any pain between the 12th rib and the gluteal folds/pubic symphysis and never radiated to the foot.[10]

2.1 | Exclusion criteria

Pregnant women have one of the following criteria: vertebral deformities such as scoliosis, based on a clinical examination, a history of previous surgery on the spine or a previous fracture of the vertebrae or pelvis, a history of a primary or metastatic spinal tumor, seronegative spondyloarthropathies, and prolonged use of drugs that cause osteoporosis like steroids.

2.2 | Medical history

A personal interrogation was conducted according to the questionnaire included the age of the patient employment status, academic achievement, the number of weekly walking hours, the number of pregnancies, the number of fetuses in the current pregnancy, shoe pattern, presence of lower back pain in the current pregnancy, and detailed information about the low back pain onset, frequency, spread, disability, exacerbation, and the presence of pain in previous pregnancies.

2.3 | Clinical examination

Completely measuring the weight in kilograms, using the Balance device Divo, and the height in meters, using a tape line able to stretch, and that is with light clothes and without shoes, and then the body mass index (BMI), which is the weight (kg)/height (m) was calculated. BMI was considered normal when it ranges between 18.5 and 24.99, overweight when it ranges between 25 and 29.99, and obese when it is more than 30. As well, we examined the patient to make sure that there was no scoliosis, and the real height was measured to make sure that there is no discrepancy in the length of both lower extremities.

2.4 | Ethics approval and consent to participate

Our study complies with the Declaration of Helsinki, the locally appointed ethics committee has approved the research protocol and written informed consent has been obtained from the subjects.

2.5 | Statistical analysis

We used Excel 2010, and the Statistical Package for the Social Sciences version 23.0 (SPSS Inc.). p value < 0.05 was considered statistically significant. We relied on frequency, percentages, and graphs for categorical variables, meanwhile, for continuous variables, standard deviation, range, and median were used. For the statistical relationships, we used the Chi-square test (χ^2 test), and t student test to test the basal differences between groups.

3 | RESULTS

3.1 | Demographic data

The study included 551 pregnant women aged 27.2 ± 6.3 years, ranging between 18 and 43 years old, their weight was 67.9 ± 11.2 kg, their height 1.58 ± 0.07 cm, and their BMI 24.83 ± 2.4 Kg/m². It was found that overweight participants were 259(47.1%), and obese participants were 19(3.5%).

There were 30(5.5%) of the sampled individuals who are illiterate, 304(55.3%) had finished elementary school, 84 (15.2%) had finished secondary school, and 132(24%) had finished college or university certificates. A total of 208 (37.8%) were employees, meanwhile, 242(62.6%) were un-employee. A total of 338 (61.4%) participants walk less than 2 h per week, 200 (36.4%) of participants walk between 2 and 4 h per week, and only 12 (2.2%) of participants walk more than 4 h per week.

The number of previous pregnancies ranged from one pregnancy to 20 pregnancies, and 396 participants gave birth previously. Only 10 (0.18%) pregnant women had twin pregnancies in the current pregnancy (Figure 1).

A total of 341 (62%) pregnant women suffered from low back pain in this study. A total of 54.60% of the pain was localized, 40.40% of the pain was sciatique, and only 5% of pregnant women had spread nonsciatique pain (Figure 2).

Most of the pregnant women indicated that their lower back pain began in the first trimester of pregnancy, where the percentage of female patients who started pain in the first trimester of pregnancy was 66%, 14.30% had back pain in the second trimester, and 19.40% had back pain in the third trimester.

A total of 48% of participants were suffering from pain during the day and daily work, while in 41% of the cases, the pain was at night, and 11.3% had pain in the morning.

About 67% of the patients had frequent pain daily, while 23% had pain two to three times a week, and only 10% of the pain frequency is once a week. The study showed that in 312 (88.57%) pregnant women, the lower back pain does not affect their daily life, while, 39(11.43%) patients had severe lower back pain, which disables their daily life.

A total of 255 (74.78%) of participants relieved their pain when they get rest, while 87 (25.51%) of participants relieved their pain by taking analgesics, and 103 (30.2%) of participants relieved their pain when they lay aside.

The pain is aggravated in 296(86.6%) of participants by standing, 123(36%) by lifting heavy materials, and 64(18.7%) by sitting, as more than one factor in each participant can aggravate the low back pain (Table 1).

3.2 | The study of the statistical relationship between the studied variables and the incidence of pain

1. We find that the average BMI of pregnant women who suffer from the low back (25.9 ± 3.06) pain is greater than women without low back pain (23.33 ± 2.57).

   To find out whether this difference is statistically significant or not, we applied the t test, which showed that $p = 0.0003$. So there is a significant statistical difference between low back pain and BMI. To study the correlation between the injury index and the body mass index, we choose
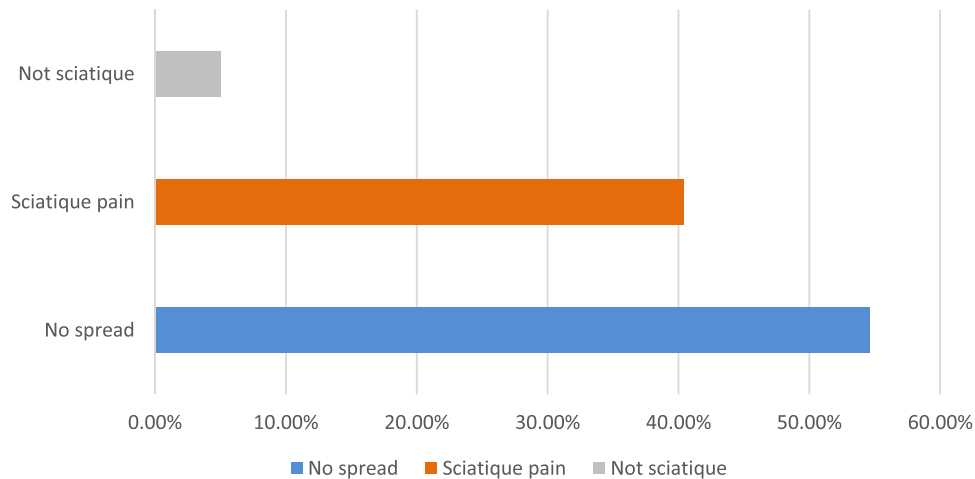
   Spearman test showed that $p = 0.0001$, which means a statistically significant correlation between body mass index and pain lower back during pregnancy.

   The relative risk between the normal weight group and the overweight group is 0.05, which means that the probability of low
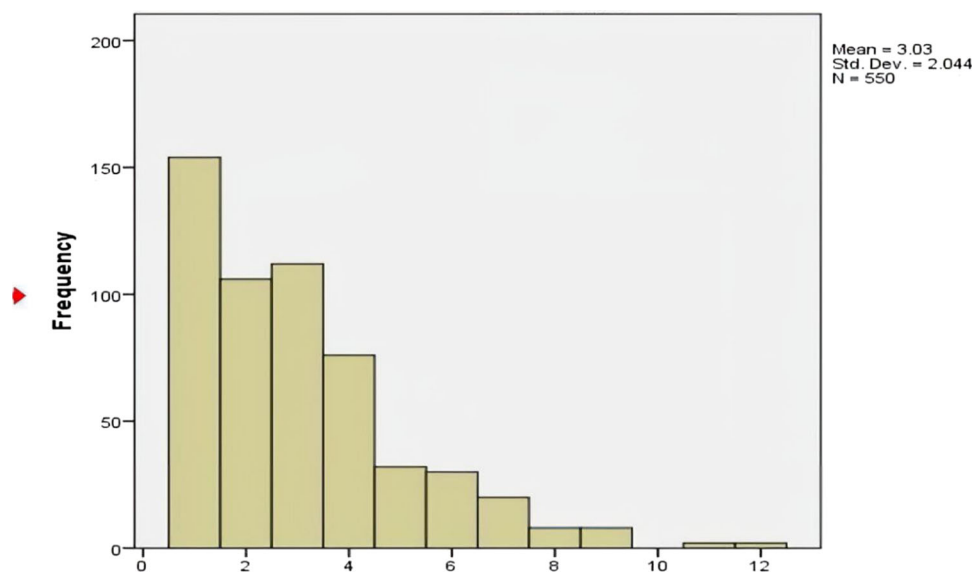
FIGURE 1 The number of previous pregnancies.

Pain spread

FIGURE 2 The percent of the spread of pain.

back pain during pregnancy is higher in the overweight group 0.05 times those of the normal weight, and the relative risk between the normal weight group and between obesity group is 0.89, meaning that the probability of lower back pain occurring during pregnancy is in the obese group was about twice as likely as those of normal weight.

2. There is no statistically significant difference between pregnant women who had low back pain and pregnant women who had not in terms of educational status, and the types of pregnancy (twins or single).

3. To find if there is a statistically significant relationship between employment and lower back pain, we used the χ^2 application, which showed that the $p = 0.004$, meaning that, there is a statistically significant relationship between nonemployment and low back pain during pregnancy. Relative risk = 5.9, and that is, the possibility of lower back pain during pregnancy among female non-employees is six times more than among female employees.

4. Our study showed that 94.9% of pregnant women wore shoes with flat heels, and by dividing the sample according to the style of the shoe, we find that pregnant women who wore high-heeled shoes suffered from lower back pain, more those who wear flat heels, without a static difference($p = 0.08$), according to χ^2 test.

5. There is no statistically significant relationship between lower back pain and the number of pregnancies ($p=0.1$), using Spearman's test.

6. By applying the χ^2 test, we found that $p = 0.0001$, meaning that there is a statistically significant relationship between lower back pain in previous pregnancies and lower back pain during the current pregnancy. The relative risk is equal to 3.10, and that is, the possibility of lower back pain during pregnancy is three times as high as if they have had pain in previous pregnancies.

7. We find that the pregnant women who had low back pain walked less than 2 h a week, and the pregnant women who had no low back pain walked 2–4 h per week.

By applying the χ^2 test, we found that the $p = 0.0001$, meaning that there is a statistically significant relationship between the number of hours of weekly walking and the incidence of lower pain that appeared during pregnancy. The relative risk = 6, that is, the possibility of lower back pain during pregnancy in pregnant women who walked less than 2 h is six times that of those who walked more than 2 h per week.

4 | DISCUSSION

The prevalence of low back pain (LBP) during pregnancy in our study was 62%, which is comparable to some international studies, where it reached 58% in the Swedish study conducted by Gutke and colleagues,[18] and 61% in the Norwegian study conducted by Malmqvist and colleagues,[19] while it was 91% in the Australian study.[20] This can be explained by the differences in the sample characteristics between this study and our study. The mean age of our participants is in concordance with other studies.[18-20]

There is a significant correlation between BMI and LBP, which is in agreement with other studies, such as the study of Kovacs et al.[21] and in the study of Wuytack et al.[22]

There was no difference due to the level of education, and this is in contractile with the study of Backhausen et al.[20] This may be due to the belief that this pain is normal during pregnancy in our Syrian society.

We found that employment is a protective factor against the occurrence of LBP in pregnant women, and we did not find any study concerning this variable. This can be explained in our society by the fact that female employees often walk for longer periods due to the transportation problems due to the Economic Blockade on Syria. Daily walking, as we found earlier, is a protective factor for LBP.

TABLE 1 The distribution of different variables studied and the relationship with pain.

	N (%)	LBP (%)	p value[a]
Population	550 (100)	341 (62)	
BMI			0.0003
Normal	272 (49.5)	154 (45.2)	
Overweight	259 (47.1)	168 (49.2)	
Obese	19 (3.5)	19 (5.6)	
Education level			0.3
Illiterate	30 (5.5)	19 (5.5)	
Elementary school education	304 (55.3)	194 (56.9)	
Secondary school education	84 (15.2)	47 (13.8)	
College or university education	132 (24)	81 (23.8)	
Weekly walking hours			0.0001
Less than 2 h	338 (61.4)	309 (90.6)	
2–4 h	200 (36.4)	30 (8.8)	
More than 4 h	12 (2.2)	2 (0.6)	
Occupation			0.0004
Employ	208 (37.8)	32 (9.4)	
Nonemploy	342 (62.6)	309 (90.6)	
Type of pregnancy			0.9
Single pregnancy	540 (99.88)	335 (98.2)	
Twin pregnancy	10 (0.18)	6 (1.8)	
Pain in previous pregnancies			0.0001
Fertile women injury	254 (46.1)	195 (76.8)	
Shoe type			0.08
Flat	522 (94.9)	320 (93.7)	
Hight	28 (5.1)	21 (6.3)	
Pain spread			
No Spread	186 (54.6)		
Sciatique pain	138 (40.4)		
Not sciatique	17 (5)		
Pain onset			
First trimester	226 (66.3)		
Second trimester	49 (14.3)		
Third trimester	66 (19.4)		
Pain timing			
Morning	39 (11.3)		
During day	165 (48.1)		
Night	137 (40)		
Pain frequency			
Daily	229 (67)		

TABLE 1 (Continued)

	N (%)	LBP (%)	p value[a]
2–3 times a week	78 (23)		
Once a week	34 (10)		
Disability			
Severe pain with disability	39 (11.43)		
Pain without disability	302 (88.57)		
Alleviating factors			
Total rest	255 (74.78)		
Pain killers	87 (25.51)		
Lie on the left side	103 (30.2)		
Aggravating factors			
Long-standing	296 (86.6)		
Long sitting	64 (18.7)		
Heavy load	123 (36)		

Abbreviation: BMI, body mass index; LBP, low back pain.
[a]The relationship between one variable and lower back pain.

It was found that walking is a preventive factor of LBP in pregnant women, which is similar to the study of Watelain and colleagues.[23]

There was no correlation between the low back pain and the number of pregnancies or the number of fetuses, and this is contractile with the Australian study.[20] Also, there was no relation between LBP, and the shoe type, like in other studies.[18–21]

By studying the factors exacerbating the pain in our study, it was found that the most common cause is prolonged standing, then weight bearing, and prolonged immobilization or sitting. Meanwhile, the Spanish study[21] found that prolonged sitting and anxiety exacerbate pain.

As for the different factors of pain in our study, the most important factor that decrease the pain was rest, then supination a side, and taking analgesics, while most studies found that exercise has the greatest effect in relieving pain, as in Andersen's study,[24] and Liddle's study.[25]

Suffering from the same pain in previous pregnancies had a statistically significant relationship with pain during the current pregnancy, which is similar to the Wuytack study,[22] Kovacs study,[21] and Backhausen study.[20]

The strengths of our study are that it is the first one done in Syria during the circumstances of the war, such as the husband's abandonment, or displacement from one region to another, prolonged standing—carrying or dragging a weight, and dependence on excess carbohydrate intake in food, many pregnant women may be exposed to increase the risk of lower back pain.

There were some limitations in our study like the one-center, one city (Damascus), and Recall Bias because of the lack of accurate information concerning the exacerbating and remitting factors for

symptoms that occurred in early pregnancy or remembered events in past pregnancies.

5 | CONCLUSION

All pregnant women should be routinely asked about this complaint during periodic pregnancy visits.

Giving pregnant women specific advice to reduce risk factors of LBP such as being overweight, and obese is very important as much as practicing exercises and walking.

AUTHOR CONTRIBUTIONS

Alaa Amayri: Conceptualization; data curation; writing—original draft. **Naram Khalayli**: Formal analysis; methodology; visualization. **Diaa Haj Ali**: Investigation; software; writing—review & editing. **Maysoun Kudsi**: Project administration; resources; supervision; validation; writing—original draft; writing—review & editing.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

TRANSPARENCY STATEMENT

The lead author Diaa Haj Ali affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

All authors have read and approved the final version of the manuscript. Corresponding author had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

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