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Pregnancy Back Pain: Its Prevalence, Pattern, and The Practice of Ergonomic Behaviors Among Pregnant Women in Rural Sule Tankarkar Local Government Area of Jigawa State Nigeria

PREGNANCY BACK PAIN: ITS PREVALENCE, PATTERN AND THE PRACTICE OF ERGONOMIC BEHAVIOURS AMONG PREGNANT WOMEN IN RURAL SULE TANKARKAR LOCAL GOVERNMENT AREA OF JIGAWA STATE NIGERIA

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ABSTRACT

Background: Studies on Back pain in pregnancy have reported rates ranging from 25% and 90%, with most studies estimating that 50% of pregnant women will suffer from back pain during the course of their pregnancy. Low back is the most common region affected followed by posterior pelvic region with upper back region being the region least affected. In Nigeria, relative to the minimum wage, back pain consumes a significantly high amount of money in accessing health care thereby incurring both direct and indirect cost. Therefore, this study explored pregnancy back pain and the practice of ergonomic behaviors among pregnant women.

Methodology: Three hundred and eighty one pregnant women were recruited using Multi-stage sampling technique from eight Primary Health Care Centers of Sule Tankarkar local government. A questionnaire was used to obtain the required information. The data was analyzed using frequency and percentage to summarize the data and inferential statistic of chi square test to check association between categorical variables.

Results: Majority of the participants are within the age range of 15-19 (34.9%), multiparous (70.3%) and

in their third trimester (54.6%). The prevalence of back pain was 57.2%, mostly in the low back region (36%). Majority of the participants (44.9%) did not practice any ergonomic behavior.

Conclusion: Low back pain is highly prevalent among pregnant women attending ante natal clinic in rural Jigawa State of Nigeria. Exercise during pregnancy, proper lifting techniques and ergonomics by experts could help pregnant women.

Keywords: back pain, ergonomic, pregnancy, postpartum

BACKGROUND

Back pain (BP) is a frequent phenomenon in pregnancy, which impacts the life of pregnant women¹. It is estimated that about half of pregnant women will suffer from some kind of low back pain at some point during their pregnancies or postpartum period^{2,3}. Factors like mechanical, hormonal and others like history of a pathology in the spine are thought to result in pregnancy back pain^{2,4,5}.

Pregnancy low back pain mimics lumbar pain outside pregnancy, however one distinguishing feature is its appearance as pain over and around the lumbar spine, above the sacrum, which allows differentiating it from pelvic girdle pain (PGP)¹ as shown in Figure 1. Unlike PGP, LBP may and may not radiate to the foot but with presence of tenderness over paravertebral muscles⁶. Though, less disabling than PGP, Low back pain (LBP) aggravates with certain activities and posture, say prolong sitting and during postpartum period⁶.

Previous studies on Back pain in pregnancy have reported rates ranges from 25% and 90%, with most studies estimating that 50% of pregnant women will suffer from back pain¹. Ayanniyi et al³, reported a prevalence of 52.5% of back pain in pregnancy with one third of them suffering from severe pain, which reduces their quality of life. The majority of women are affected in their first pregnancy^{3,7}. Also, low back is the most common region affected followed by posterior pelvic region while upper back region being the least region affected³. During pregnancy, LBP seems to be the determinants of postpartum LBP². previous pelvic trauma⁴, history of chronic back pain in a previous pregnancy^{4,8,9}, previous pregnancy¹⁰, excessive body weight¹¹ and LBP during

menstruation⁷ were said to be important risk factors for pregnancy related back pain.

While it is difficult to eliminate back pain, the severity can be reduced in high risk women by encouraging prospective mothers to observe proper ergonomic behaviors¹². Physical activity before pregnancy is correlated with a decrease risk of developing low back pain, which does not apply to PGP⁶. It is essential for women to learn appropriate lifting technique without stressing their backs. Also, they should be advised to use proper seats, cushions and beds, as well as proper transfer techniques in and out of bed, so that the body maintains a proper position and the spine is supported¹³.

Majority of pregnant women view pregnancy back pain as an unavoidable and usual sensation during pregnancy¹, as only half seek advice from a health care professional and 70% of them will receive some kind of treatment¹¹. Ayanniyi et al. reported that postural modification relieved the back pain in about 50% of pregnant women. Early identification and treatment, taking under consideration the individuality of every woman and pregnancy, provide the opportunity for the best possible outcome¹. However, to our knowledge, there is a dearth of information about the prevalence of back pain and the level of adherence to the practice of ergonomics among pregnant women in rural area. Base on the fact that pain is the highest cause of economic burden to humans¹⁴, to the extent that the cost of low back pain management in developing countries like Nigeria may amount to 50% of the annual salary of the affected individuals¹⁵, this study explored pregnancy associated back pain and the practice of ergonomic behaviors among pregnant women in rural area of SuleTankarkar, local government, Jigawa state.

METHODS

Population and Research Design

This was a cross-sectional survey among all consenting pregnant women from primary healthcare centers (PHC) in SuleTankarkar, local government, Jigawa state.

Sample Size Determination and Sampling technique

To achieve a power of 95% CI at significance level of 0.05 and prevalence of 34.4% from a previous study, 345 sample was determined using

$$n = Z^2 pq / d^2 \text{ }^{16}$$

Where n=the desired sample size

Z= standard normal deviation set at 1.96 that corresponds to the 95% confidence interval.

P =prevalence of pregnancy back pain which is 34.4% in a study done in Kano¹⁷.

Q = complimentary probability =1.0 - p =1.0 - 0.34% = 0.66%

d = the degree of accuracy (precision) set at 0.05 (acceptable margin error)

$$n = (1.96)^2 \times 0.34 \times 0.66 / 0.05^2$$

Therefore $n = 345$

Assuming 10% loss rate, $345 + 10\%$ (wastage factor and non-response rate) = 380 were proposed to participate.

Sampling Technique

Multi-stage sampling technique was used, there are 16 PHCs in Sule Tankarkar local government. 50% of the PHCs⁸ were randomly selected for the study. The sample size was divided equally amongst the 8 PHCs (76 participant each). Participants were recruited using systemic sampling.

Exclusion Criteria

- Pregnant women with history of back pain before pregnancy.
- Pregnant women with history of back trauma.

Instrument

The instrument for this study was a researcher-administered close-ended questionnaire, which was designed to obtain information on subjects' demographic status, back pain and ergonomic practice. The questionnaire was a modified version of the questionnaire by Ayanniyi et al.³ and Manyozo et al.¹⁸ and an ergonomic practice component by Ephraim-Emmanuel, et al.¹⁹. The modified version of the questionnaire (APPENDIX I) was assessed by experts in physiotherapy to ensure its face and content validity. A pilot study gave its test-retest reliability to be $r = 0.72$. It has three sections A, B and C. Section A collected information on demography such as age, body mass index, trimester, educational status, gravidity and parity, section B collected details of low back pain; its prevalence, body part affected, nature of the pain, the effect of low back pain on activities of daily living while section C enquires about ergonomic practice component. The practice component had ten questions on a yes or no basis, where 0 was awarded to "no" and 1 was awarded to "yes" option. A score of 0 was recognized as no practice of ergonomic behavior, 1-3 was categorized as poor practice, 4-6 as fair, and above 7 as good practice. With respect to the location of pain in section B, it was categorized into three groups' i.e Low Back Pain (LBP), High back pain (HBP) and Posterior pelvic pain (PPP).

Ethical consideration

The study was approved by Jigawa state research ethics committee with reference number JHREC/2020/002. An informed consent was sought before commencement of data collection.

Analysis of Data

Data was analyzed using SPSS 20.0 version software using a descriptive statistic of frequency and percentage to summarize the data and inferential statistic of chi square test to check association between categorical variables. Probability level was set at 0.05.

RESULTS

Three hundred and eighty one individuals were interviewed using the questionnaire and all were included in the analysis. Table 1 shows the demographic details of the participants. Majority of the participants are within the age range of 15-19 (34.9%), multigravidas (72.4%), multiparous (70.3%) in their third trimester (54.6%) with no formal education (76.1%), with normal body mass index (BMI) (84%) and no history of any medical comorbidity (74.5%). Incidence of low back pain in the previous pregnancy was 72.9%.

More than half (57.2%) of the participants experienced low back pain in their current pregnancy (Figure 1). The part of the back mostly affected is low back (36%) followed by combined low back and pelvic girdle pain (Figure 2).

The back pain experienced by the participants is mild to moderate in severity and, intermittent (69%) in occurrence. It is most often provoked by sitting in the table (25.2%) and worsen with coughing (32%) (Table 2).

The pain disturbed the sleeping of one-tenth (11.3%) of the participants while in almost a quarter the pain interfered with their activities of daily living. Most of the participants had difficulty in lifting heavy objects (42.3%), doing heavy work (39.9%), sitting for long (37.5%) and it hindered participation in exercises (35.4%) (Table 3).

Only one-tenth (11.3%) of the participants possess good ergonomic behaviors while 44.9% did not practice any ergonomic behavior (Figure 3). Table 4 showed a significant association between the practice of ergonomic behaviors and prevalence of back pain among the participants ($p < 0.05$).

There was significant association between the prevalence of low back pain and age, gravidity, parity, level of education, BMI and back pain in the previous pregnancy ($P < 0.05$) (Tables 4 and 5). However, there was no significant association between the prevalence of low back pain and the trimester of pregnancy ($P > 0.05$).

howed that only age (OR= 0.22, 95 CL (0.98-0.50), $p < 0.05$), trimester (OR= 2.6, 95 CL (1.22-5.56), $p < 0.05$), presence of comorbidity (OR= 0.037, 95 CL (0.01-0.12), $p < 0.05$) and history of back pain in the previous pregnancy (OR= 0.26, 95% CL (0.10-0.71), $p < 0.05$) were determinant of back pain among the participants.

DISCUSSION

Out of the three hundred and eighty-one pregnant women that participated in this study. The incidence of back pain in our population was 57.2%. This result was in consistent with the earlier study by Ayanniyet al.³ which reported that back pain is one of the common complaint of women during pregnancy. Others

have also reported that at least half of pregnant women will experience a form of back pain to some degree during pregnancy^{6,20,21}.

Pregnant women with LBP had the highest frequency (36%) which was higher than the two other groups combined (i.e HBP+PPP). This was consistent with the outcome in Ayanniyi et al.,³ but in contrast to Colliton²² who found PPP is approximately four times as prevalent as low back pain during pregnancy and Noren et al.,²³ who stated that PPP constituted half or more of women with back pain during pregnancy. The variation in prevalence of pain location based on back sub-region might be influenced by the way data was collected. Data on LBP is commonly collected using questionnaires^{2,24}. Although, for optimum distinguishing of LBP from PGP, a pictorial demonstration should be shown to the pregnant women for identification²⁵. Unfortunately, we were not able to clinically examine all the women. However, we based our classification and recording on a verbal explanation of the various back sub regions by the research assistants to the participants and the participants described the location where they were experiencing the pain back to the research assistant for documentation.

Although, higher education level has been found to be associated with severity of pain symptoms in pregnancy²⁶. Most of the pregnant women in this study reported a moderate pain intensity while more than three quarter had no formal education. The reduction in their pain severity could be explained by socio-cultural attribute of people of Northern part of Nigeria to pain. Pain tolerance has also been shown to be strongly associated with ethnic differences in one of the earlier study in another developing country²⁷. Less than one-quarter of the women reported that they had to limit their daily activities especially activities that has to do with lifting heavy object, sitting for long, and participation in any form of exercise. These rates are lower than those seen in the study by Shijagurumayum et al.²⁸.

A very low percentage (11.3%) of the participants in this study possess a good practice of ergonomics in form of maintaining good posture during activities of daily livings and proper lifting techniques. However, the result of chi-square statistics run in this study showed that, pregnant women practicing ergonomic behaviors were the majority of the participants with back pain. This might be due to the fact that, they might not have started observing the ergonomic behaviors until after they started experiencing the back pain and sought medical advice from their health care provider who advise them on proper sitting and posture. Another reason might be because they wrongly observe the behaviors not as prescribed by their health care provider as this study failed to use pictures to explore the way they practice the ergonomics behaviors.

Younger age was shown to be a risk factor for back pain in this study. This could be linked to the fact that the body of the younger ones is trying to adjust to the new normal unlike the older ones. It could also be due to fact that the elder ones may not report the back pain compared to the younger ones as they may

think back pain is normal in pregnancy. Likewise, the trimester of the participants was a determinant of back pain during the pregnancy and this might be true because of the increase in stretching of core stability muscles, change in spinal curvature among other factors caused by the growing fetus.

Due to the fact that, most of the participants had low levels of education, oral administration of the questionnaire was utilized to obtain data.

LIMITATIONS

This was a facility based study and as such, the prevalence reported may not be generalized. It only included those who attended antenatal clinics in that area. The study also recruited participants from a rural setting only, therefore, results may not reflect the urban situation for pregnant women as they may be characteristically very different.

Another possible limitation is that the questionnaires were administered by a research assistant as opposed to self-administration. Likewise, the study failed to use pictorial demonstration while asking the questions on location on the pain and the practice of ergonomic behaviors.

CONCLUSIONS

Low back pain is highly prevalent among pregnant women attending ante natal clinic in rural Jigawa State of Nigeria. Many pregnant women suffer considerable pain and discomfort during pregnancy. Their experiences result into reduced activity engagement, exercise participation and self-productivity. Given the prevalence and the clinical importance of LBP in pregnancy, health workers should be proactive in engaging these pregnant women on health education that will be beneficial during pregnancy back care education inclusive. Further studies should consider a wider variety of population and settings to study the varied LBP experience in pregnant women and the role of ergonomic education towards LBP during pregnancy in the rural area.

LIST OF ABBREVIATIONS

PHC= primary health care

LBP= low back pain

HBP= Upper back pain

PPP= posterior pelvic girdle pain

Competing interest

Authors declared no competing interest

Funding

Study was self-funded

Authors' contributions

DGM initiated and designed the study, analyzed the data, wrote methodology, results section and coordinate the study. YTB, SAM and MI contributed in performing literature review, data collection, discussion and manuscript review. SAM help in data analysis, writing the draft of the manuscript for publication. All authors have read and approved the final version of the manuscript.

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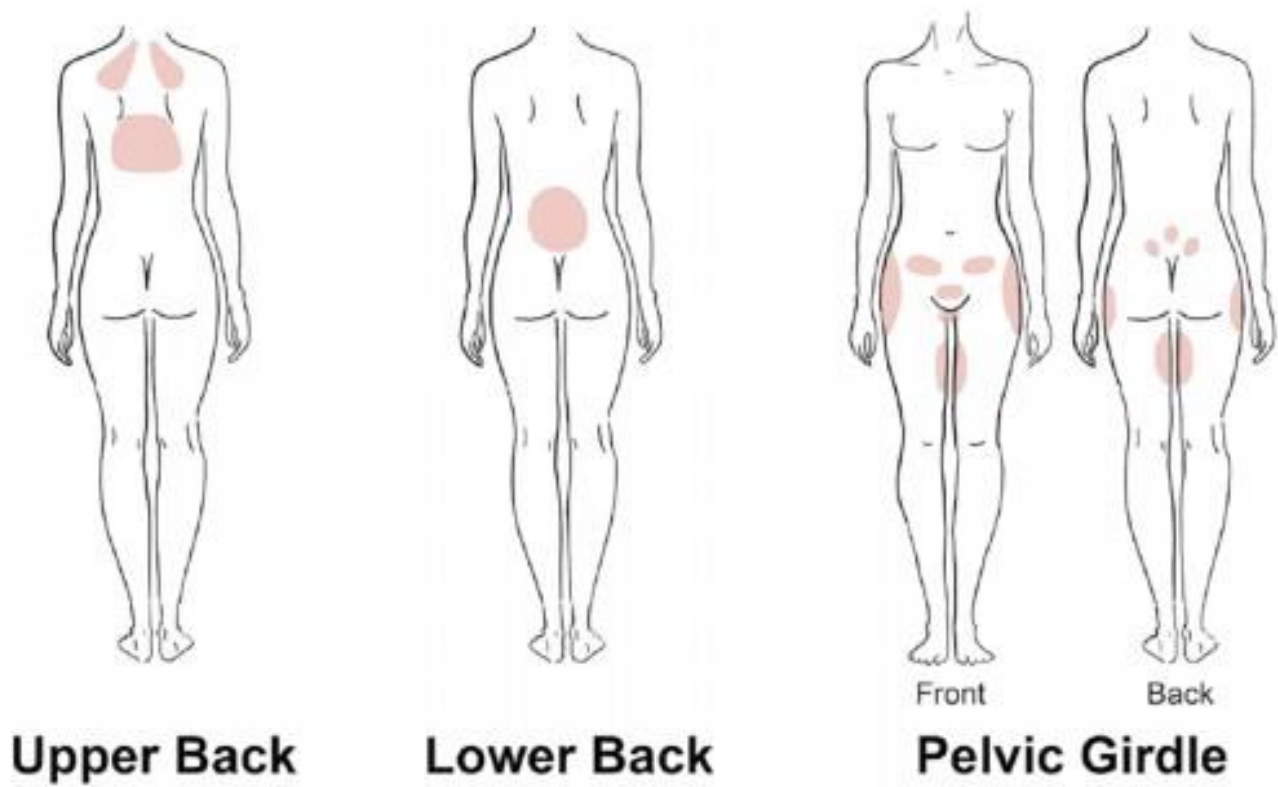


Figure 1 illustration for identification of the location of the pain by the participants

Dunn et al. (29)

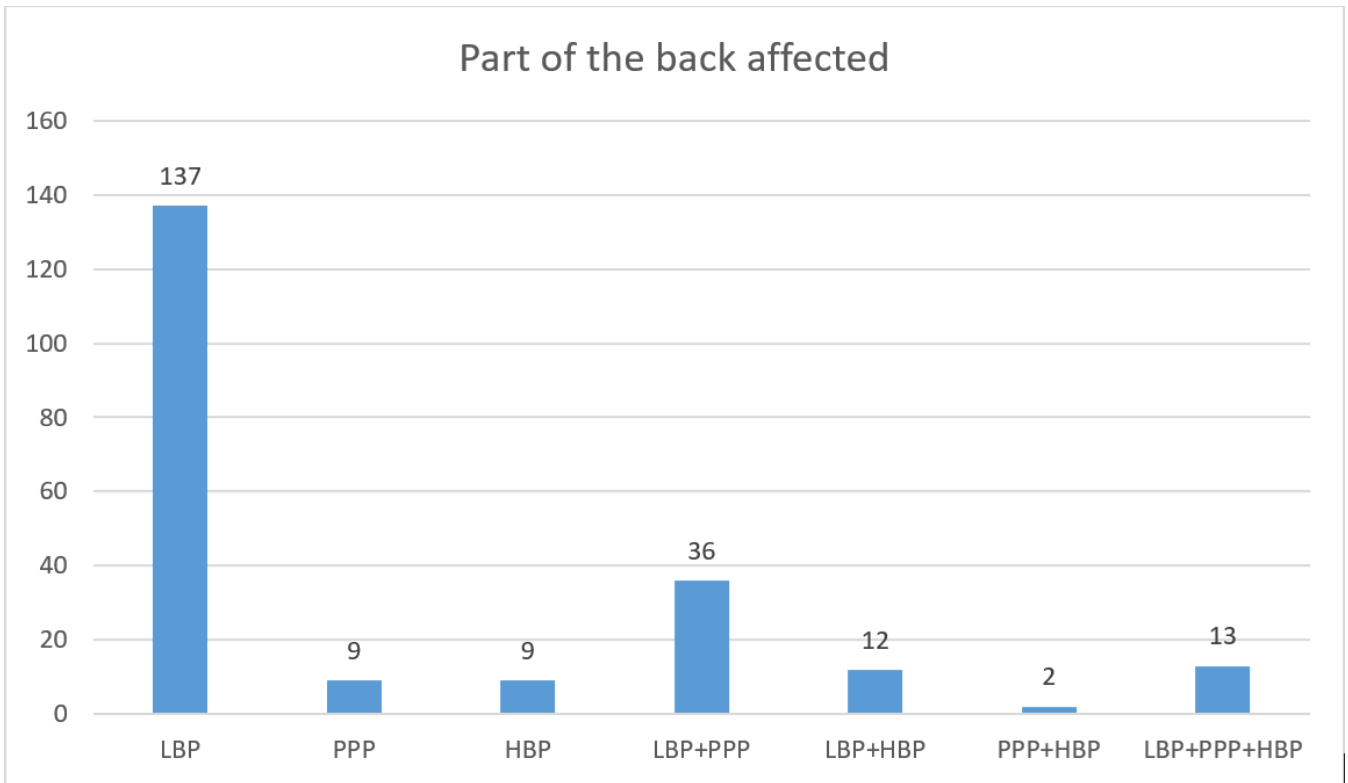


Figure 2 Part of the back affected: LBP= Low Back Pain, HBP= High back pain and(PPP= Posterior pelvic pain

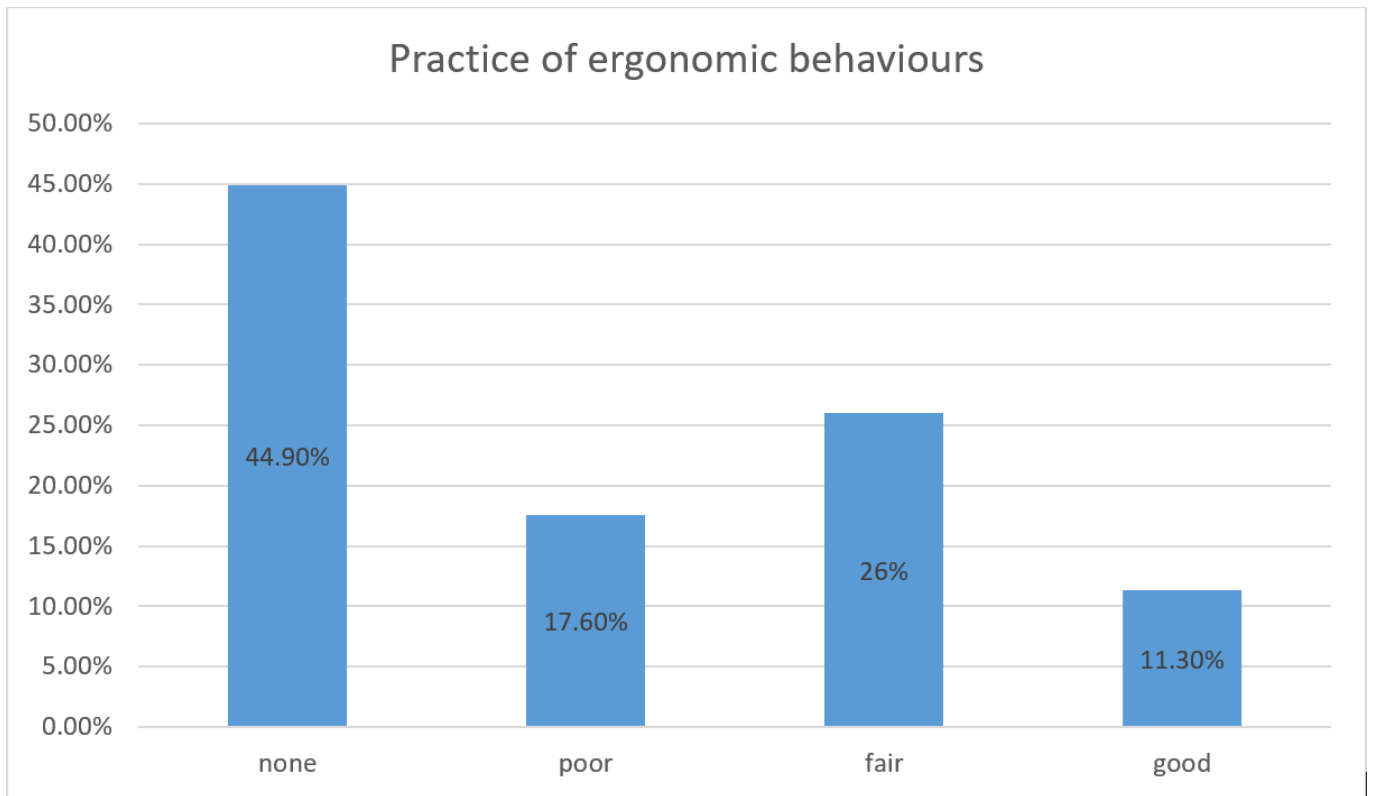


Figure 3 Practice of ergonomic behaviors

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Table 1 Participant's Details

Variables	Frequency	Percentage
Age		
15-19	133	34.9
20-24	111	29.1
25-29	70	18.4
30-34	54	14.2
35-39	7	1.8
40-44	6	1.6
Gravidity		
Primi-gravida	105	27.6
Multigravida	276	72.4
Parity		
Nulliparous	113	29.7
Multiparous	268	70.3
Trimester		
First	21	5.5
Second	152	39.9
Third	208	54.6
Level of education		
Non-formal	290	76.1
Primary	52	13.6
Secondary	23	6.0
Tertiary	16	4.2
BMI		
Underweight	39	10.2
Normal	320	84.0
Overweight	22	5.8
Any medical condition		
No	284	74.5
Yes	97	25.5
Back pain in the previous pregnancy		
No	274	72.9
Yes	107	28.1

Table 2 Nature, Severity and Character of the Pain

Variables	Frequency	Percentage
Severity of the pain		
Mild	83	21.8
Moderate	107	28.1
Severe	20	5.2
Fluctuates	8	2.1
Character of the pain		
Intermittent	120	31.5
Continuous	86	22.6
Nature of your back pain		
Numbness	52	13.6
Tingling	69	18.1
Burning	64	16.8
Electrical shock	22	5.8
Dull	11	2.9
Period of the day when back pain disturbed you most?		
No	156	41.0
Morning	15	3.9
Afternoon	42	11.0
Evening	7	1.8
Night	49	12.9
Not Sure OR Varying	112	29.4
Which activity brings back the pain?		
No	163	42.8
Standing	23	6.0
Sitting	96	25.2
Bending over	58	15.2
Lifting	22	5.8
Lying down	19	5.0
Which action makes the pain worst?		
No	175	46.0
Coughing	122	32.0
Sneezing	36	9.4
Straining during bowel movement	48	12.6

Table 3 Effect of the Pregnancy Back Pain on Sleeping and Activities of Daily Living

Variables	Frequency	Percentage
Does your back pain affect your sleeping?		
No	336	88.2
Does your back pain affect your activities of living?		
No	290	76.1
Yes	94	23.8
Activities affected*		
Dressing	11	2.9
Outdoor walk	55	14.4
Sitting for long	143	37.5
Climbing stairs	42	11.0
Carrying a bag	33	8.7
Making a bed	97	25.5
Running	125	32.8
Light work	110	28.9
Heavy work	152	39.9
Lifting heavy object	161	42.3
Participating in exercise	135	35.4
*Multiple response		

Table 4 Association Between Socio-demographic Variables and Prevalence of Pregnancy Low Back Pain

Variables	No	Yes	X ² /Fisher Exact	p-value
Age			39.97	0.00*
15-19	37 (9.7)	96 (25.2)		
20 - 24	49 (12.9)	62 (16.3)		
25 - 29	35 (9.2)	35 (9.2)		
30 - 34	36 (9.4)	18 (4.7)		
35 - 39	0 (0)	7 (1.8)		
40 - 44	6 (1.6)	0 (0)		
Gravidity			11.42	0.00*
Primi-gravida	60 (15.7)	45 (11.8)		
Multigravida	103 (27)	173 (50.4)		
Parity			6.40	0.01*
Nulliparous	60 (15.7)	53 (13.9)		
Multiparous	103 (27)	165 (43.3)		
Trimester				
First	9 (2.4)	12 (3.1)		
Second	66 (17.3)	86 (22.6)		
Third	88 (23.1)	120 (31.5)		
Level of education			31.03	0.00*
Non-formal	143 (37.5)	147 (38.6)		
Primary	9 (2.4)	43 (11.3)		
Secondary	11 (2.9)	12 (3.1)		
Tertiary	0 (0)	16 (4.2)		
BMI			35.26	0.00*
Underweight	27 (7.1)	12 (3.2)		
Normal	136 (35.9)	179 (47.2)		
Overweight	0 (0)	25 (6.6)		
Back pain in the previous pregnancy			25.18	0.00*
No	139 (36.5)	135 (35.4)		
Yes	24 (6.3)	8 (21.3)		
Practice of ergonomic behavior			341.3	0.00*
No	162 (42.6)	9 (2.4)		
Yes	0 (0)	209 (55)		

Table 5 Binary Logistic Regression to Determine Risk Factors of Back Pain Among the Participant

Variables	AOR (95% CI)	p-value
Age		
15 – 19	1	
20 – 24	0.22 (0.98-0.50)	0.00*
25 – 29	0.38 (0.15-0.96)	0.04*
30 – 34	0.00	1.00
35 – 39	0.00	1.00
40 – 44	1.1E9 (0.00—)	1.00
Gravidity		
Primi-gravida	1	
Multigravida	0.00	1.00
Parity		
Nulliparous	1	
Multiparous	4.3E7 (0.00—)	1.00
Trimester		
First	1	
Second	1.52 (0.43-5.4)	0.51
Third	2.6 (1.22-5.56)	0.01*
Level of education		
Non-formal	1	
Primary	0.00	1.00
Secondary	0.00	1.00
Tertiary	0.00	1.00
BMI		
Underweight	1	
Normal	0.00	1.00
Overweight	0.00	1.00
Any medical condition		
No	1	
Yes	0.037 (0.01-0.12)	0.00*
Back pain in the previous pregnancy		
No	1	
Yes	0.26 (0.10-0.71)	0.01*