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Research Article

## MUSCULOSKELETAL PROBLEMS AMONG PREGNANT WOMEN: A FACILITY BASED SURVEY IN ODISHA

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### ABSTRACT

**Background:** Chronic medical conditions are in focus for the development of strategies aimed at improving population health worldwide. This is also true for chronic pain conditions leading to impaired or non-existent ability to exercise, as physical inactivity is associated with the development of chronic diseases. Musculoskeletal disorders constitute an estimated 90% of all chronic pain, of which back pain contributes to a high extent. During the time of pregnancy many hormonal and anatomical changes that affect the musculoskeletal system in the female body, which may cause various musculoskeletal complaints, predispose to injury, or alter the course of pre-existing conditions. Though Obstetric physiotherapy is an essential part of maternal health care and promotion; still it is not well known in developing countries like India. So this current study aimed to address common musculoskeletal complaints arising among the women during prenatal period in Odisha. **Methodology:** A cross sectional study was designed in rural & urban area health facilities targeting the pregnant women of Odisha. Total of 410 pregnant women from selected facilities of two different regions of Odisha- Eastern (Urban) and Western (Rural) were interviewed with a structured validated questionnaire. Statistical analysis compared the independent variables of participants with Musculoskeletal Pain using independent sample t-test for continuous variables and chi-square for ordinal/nominal variables has been reported considering null hypothesis to be significant if p-value is <0.05 which is level of significance. **Results:** About half (50.7%) of the participants reported symptoms at least in one part of their bodies, over the pregnancy period. Among these, acute Low back pain was the highest of 55.6% and 35.4% of chronic, followed by acute ankle pain (25.9%) and knee pain (16.6%). Neck pain (4.9%), Shoulder pain (4.4%) were the least reported among all participants. The MSDs pain is more among the urban population (54.4%), compared to rural community (45.6%), which shows statistically significant with p-value of 0.003. **Conclusion:** Low back pain is the commonest of all, prevailing around more than half of subjects from our sample. A mixed research method strongly recommended to conduct, including both pre and post-natal period women, for generalizability and other facilities from all over the globe should be focused.

**Keywords:** Musculoskeletal problems, Pregnant Women, MSDs Pain

### INTRODUCTION

Chronic medical conditions are in focus for the development of strategies aimed at improving population health worldwide. This is also true for

chronic pain conditions leading to impaired or non-existent ability to exercise, as physical inactivity is associated with development of chronic diseases.

Musculoskeletal disorders constitute an estimated 90% of all chronic pain, of which back pain contributes to a high extent.

During the time of pregnancy, many hormonal and anatomical changes that affect the musculoskeletal system in the female body, which may cause various musculoskeletal complaints, predispose to injury, or alter the course of pre-existing conditions<sup>1</sup>.

Biomechanical factors also play a larger role with hormonal influences to produce symptoms in mild to late pregnancy<sup>2</sup>. Usually weight gain experienced during pregnancy results in postural changes that produce pain and musculoskeletal complaints in pregnant women. Exaggerated lordosis of the lower back, forward flexion of the neck, and downward movement of the shoulders typically occur to compensate for the enlarged uterus and change in center of gravity. A significant increase in the anterior tilt of the pelvis occurs, with increased use of hip extensor, abductor, and ankle plantar flexor muscles<sup>3</sup>.

It is estimated that most of all women experience some degree of musculoskeletal problem during pregnancy and at least 25% have temporarily disabled symptoms<sup>4</sup>. 70% of all women suffer low back pain during pregnancy. Lower extremity pain is also common in pregnant women<sup>1, 5</sup>. The common musculoskeletal complaints during pregnancy include low back pain, sacroiliac joint pain, carpal tunnel syndrome, de Quervain's stenosing tenosynovitis, pelvic pain, stress incontinence etc<sup>1</sup>. Physiotherapy can play a vital role in obstetrics. The principles of physiotherapy in obstetrics were first developed by Miss Minnie Randall OBE, who was a great physiotherapist in the early 20th century<sup>6</sup>.

Most of the musculoskeletal problems that arise during pregnancy can be prevented and treated with physiotherapy treatment. The 2003 joint statement of the society of Obstetrics and Gynaecologists (SOGC) and the Canadian Society of Exercise Physiology (CSEP) recommended various therapeutic exercises associated with the resistance exercises in addition to aerobic exercises for pregnant women<sup>7</sup>.

The population is becoming aware to understanding the benefits of exercise and a healthy lifestyle. It is important for the physician to understand the effects of exercise on the mother and her unborn child, thus many women want to continue their exercise

regimens throughout their pregnancies<sup>1</sup>. Pregnant women with uncomplicated pregnancies should be encouraged to continue and engage in physical activities because pregnancy is not a state of confinement. As pregnancy is associated with profound anatomical and physiological changes so, proper and individualized exercise may help to prevent and combat many of the musculoskeletal complications associated with pregnancy<sup>7</sup>.

In Odisha the promotion of proper maternity care is still remains a great challenge. Though Obstetric physiotherapy is an essential part of maternal health care and promotion; still it is not well known in Odisha. Research makes the profession strongest and this study can show the need to establish the skills of physiotherapists particularly in the Gynaecology and Obstetrics area.

The study aimed to address common musculoskeletal complaints arising among the women during the prenatal period in Odisha, with the following objectives;

1. To explore common pregnancy related musculoskeletal complaints arising among pregnant women at selected hospitals in Odisha.
2. To identify the prevalence of low back pain among the pregnant women in Odisha.
3. To find out association between various factors like physical activity level, BMI, gestational age, various age groups etc. Among the pregnant women.
4. To spread the awareness regarding common antenatal musculoskeletal problems and their prevention by using physiotherapy approaches.
5. To educate the clients regarding various strengthening and stretching techniques which are beneficial for them to do to their activities of daily living more efficiently during & after delivery.

## METHODOLOGY

After the approval of Institutional Ethics Committee the cross sectional study was conducted in rural & urban area health facilities targeting the pregnant women of Odisha. As this was a survey on common pregnancy related musculoskeletal complaints arising among the women during the prenatal period, a researcher was interested to collect data from the pregnant women

who came for clinical check-up as an outpatient at Obstetrics & Gynaecology Department in different hospitals throughout their pregnancy, so study site were selected health facilities of the Eastern (Urban) as well Western (Rural) Odisha for the study, with purposive sampling. The actual sample size of this study was calculated as 288, with Prevalence=35% from previous research, but totally we enrolled around 410 pregnant women for the current study. All pregnant women are selected randomly with inclusion criteria of Multigravida or primigravida both were selected to identify the frequency of pregnancy related musculoskeletal complaints in both gravida, irrespective of age and trimester status of pregnancy. They are provided with written informed consent. Questionnaire is provided to only those clients who have given their consent to cooperate with our research procedures. Those who did not fulfil the inclusion criteria were excluded such as subjects who were medically unstable or having Persistent or previous pathological and traumatic history of musculoskeletal system of the body. A structured, validated Questionnaire was administered among the clients in presence of their respective Family members', which contains: Demographic Data with Personal History and Ergonomic hazards, objectively two internationally (Nordic Musculoskeletal Questionnaire and The Quebec Back pain disability scale) standardized tools have been used for collecting data. At the end of data collection, clients are demonstrated with various antenatal exercises for strengthening and stretching the weak and tight musculature. A printed version of Pre-natal and post-natal common exercises template has been provided to all participants for future reference.

Data were summarized using the descriptive statistics of mean, standard deviation and percentages. Statistical analysis compared the independent variables of participants with Musculoskeletal Pain using independent sample t-test for continuous variables and chi-square for ordinal/nominal variables has been reported considering null hypothesis to be significant if p-value is <0.05 which is level of significance. The data analysis carried out using R version 3.0.1 software

## RESULTS

Table 1 explains the demographic statistical value of women. The mean age, height, weight and body mass

index of all respondents were  $25 \pm 4$  years,  $158 \pm 6.12$  cm,  $58 \pm 9$  Kg and  $23.22 \pm 3.9$  Kg/m<sup>2</sup> respectively. The mean education of participants was 12th class, with average family income of more than 18,000 per month.

**Table1: Descriptive Statistics of Participants**

Variable	Mean $\pm$ SD	Min-Max
Age (yrs)	25 $\pm$ 4	18-40
Education	12 $\pm$ 2	0-13
Height (cm)	158 $\pm$ 6.12	125-169
Weight (Kg)	58 $\pm$ 9	30-90
BMI (kg/m <sup>2</sup> )	23.22 $\pm$ 3.9	13.01-36.26
Monthly Income (INR)	18,845 $\pm$ 9236	4,000-50,000

About half (50.7%) of the participants reported symptoms at least in one part of their bodies, over the pregnancy period. Among these, the acute Low back pain was the highest (55.6%) and 35.4% chronic, followed by acute ankle pain (25.9%) and knee pain (16.6%). Neck pain (4.9%), Shoulder pain (4.4%) were the least reported among all participants as shown in Figure-1. As the age of pregnancy increases the chances of getting muscular pain also increases, which clearly resulted in Table-2. The MSDs pain is highest in late age pregnancy i.e. 35-49yrs (72.7%) as compared to 20-34 yrs. (63.2%) and 15-19yrs (53.8%) pregnancy. Similarly as the gestational age increases the perception of musculoskeletal disorders (MSDs) pain too increases simultaneously. The MSDs lowest only 49% in 1st trimester, increased to 64.6% as women move to 2nd trimester and reach the highest in 3rd trimester as 70.2%, which may be due to the physiological as well as hormonal changes. The relation between BMI and MSDs pain, which shows a controversial interpretation. As the MSDs pain high in underweight (69.2%) BMI as well in obese (72%) BMI, might be due to some of confounders in among the participants. Its least as the BMI is normal (60%). The interesting finding was physical inactivity leads to higher chances of MSDs pain (70%). But those women who involved them in some kind of physical activity the MSDs pain perception is least (63.1%). Similarly, as the pain increases the disability too occurs during daily activities. As 95.9% women with pain have a moderate disability compared to 56.1% women with mild disability, which resulted poor quality of life during pregnancy period.

The Table-2 analysis describes the variables which have significant contribution towards pain

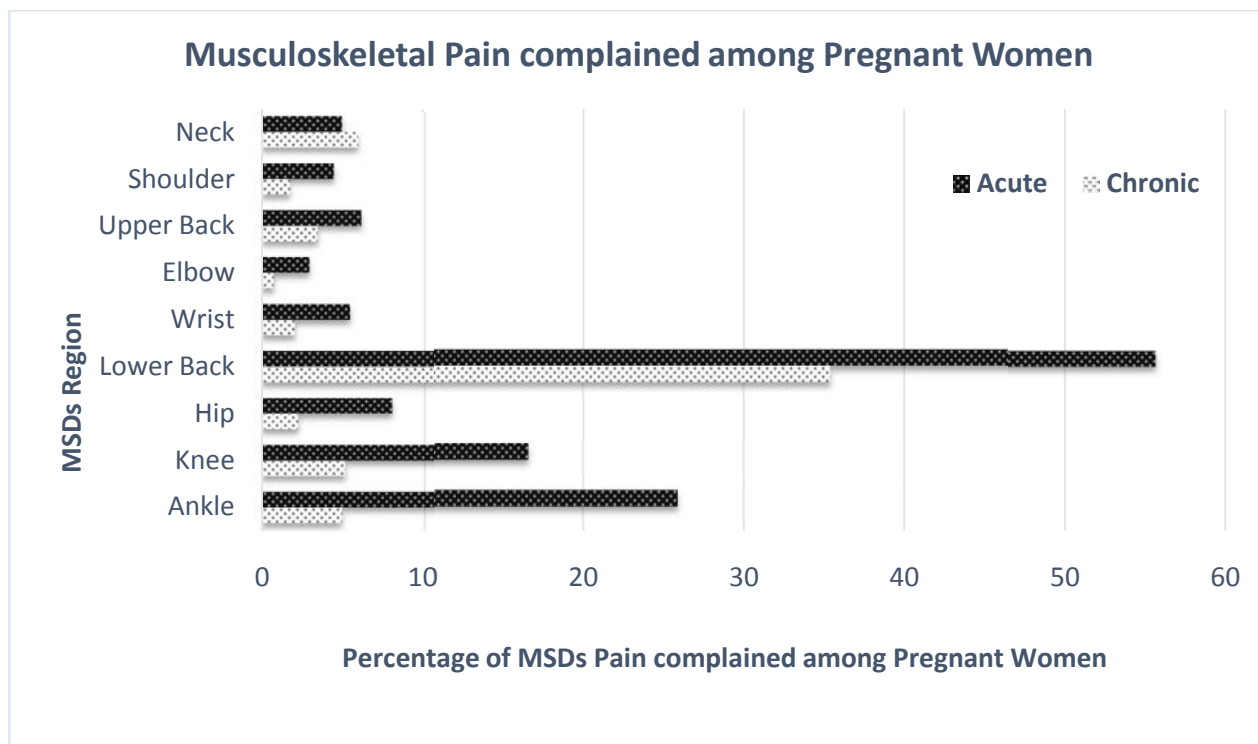
development during pregnancy. The MSDs pain is more among the urban population (54.4%), compared to rural community (45.6%), which shows statistically significant with p-value of 0.003. Same time those having some present / past medical history, they are susceptible to developing pain as p-

value shows 0.000 and 0.001 respectively. A strong co-relation found in gestational age with pain increment as p-value 0.000. Similarly, disability also shows significant relation as severe disability leads to activity limitation, further (p-value= 0.000).

**Table 2: Relation between different variables with Musculoskeletal Disorders (MSDs) Pain**

Variable	Category	No MSDs (n=151)	MSDs (n=259)	p-Value
Age	15-19yrs (n=13)	6 (4%)	7 (2.7%)	0.632
	20-34yrs (n=386)	142 (94%)	244(94.2%)	
	35-49yrs (n=11)	3 (2%)	8 (3.1%)	
Religion	Hindu (n=383)	143 (94.7%)	240(92.7%)	0.001
	Others (n=27)	8 (5.3%)	19 (7.3%)	
Occupation	Housewife (n=401)	150(99.3%)	251(96.9%)	0.098
	Working (n=9)	1(0.7%)	8(3.1%)	
Education	No Education (n=38)	10(6.6%)	28(10.8%)	0.048*
	Primary (n=87)	25(16.6%)	62(23.9%)	
	Secondary/ Higher(n=285)	116(76.8%)	169(65.3%)	
Gestational Age	1st Trimester(n=98)	50(33.1%)	48(18.6%)	0.000***
	2nd Trimester (n=144)	51(33.8%)	93(35.9%)	
	3rd Trimester (n=168)	50(33.1%)	118(45.5%)	
Dietary Habit	Vegetarian(n=103)	37(24.5%)	66 (25.5%)	0.066
	Non-Vegetarian(n=307)	114(75.5%)	193(74.5%)	
Physical Activity	No (n=4)	1(0.7%)	3(1.2%)	0.530
	Yes(n=406)	150(99.3%)	256(98.8%)	
Recreational Activity	No (n=4)	1(0.7%)	3(1.2%)	0.003**
	Yes(406)	150 (99.3%)	256(98.8%)	
Past Medical Disorders	No (n=352)	132(87.4%)	220(84.9%)	0.001**
	Yes(n=58)	19(12.5%)	39(15.1%)	
Current Medical Disorders	No (n=293)	138(91.4%)	155(59.8%)	0.000***
	Yes(n=117)	13(8.6%)	104(40.2%)	
USG Info	Abnormal (n=19)	3(2%)	16(6.2%)	0.000***
	Normal (n=348)	120(79.4%)	228(88.1%)	
	Not Available(n=33)	28(18.6%)	15(5.7%)	
QBP Disability Score	Mild(n=337)	148(98%)	189(73%)	0.000***
	Moderate(n=73)	3(2%)	70(27%)	
	Severe(n=0)	0	0	
Family Monthly Income (INR)	<10,000 (n=87)	32(21.2%)	55(21.2%)	0.944
	10,000-20,000(n=202)	73(48.3%)	129(49.8%)	
	>20,000(n=121)	46(30.5%)	75(29%)	
BMI	Underweight(n=39)	12(7.9%)	27(10.4%)	0.400
	Normal(n=245)	98(64.9%)	147(56.8%)	
	Overweight(n=101)	34(22.5%)	67(25.9%)	
	Obese(n=25)	7(4.6%)	18(6.9%)	
Community	Rural(n=165)	47(31.1%)	118(45.6%)	0.003**
	Urban(n=245)	104(68.9%)	141(54.4%)	

Signif. Codes: \*significant, \*\* Highly significant, \*\*\* extreme significant



**Fig 1: Distribution of MSDs Pain in different body region**

## DISCUSSION

The aim of the study was to identify common pregnancy related musculoskeletal complaints arising among the women during the prenatal period in selected hospitals in Odisha. There were 410 samples in this study. The majority of the respondents almost 35-49yrs (72.7%) and in 3rd trimester as 70.2% reported MSDs pain in their body region. The most complained MSDs was acute Low back pain (55.6%), followed by acute ankle pain (25.9%) and knee pain (16.6%). Whereas a study of Swedish women, almost 69% of the participants reported suffering from low back pain during their pregnancy<sup>8</sup>. According to Hills<sup>9</sup> 50-90% women suffered from low back pain in the prenatal period. In a study, 59% of Iranian women suffered from low back pain during their pregnancy<sup>10</sup>. The results of these studies support the current study result of low back pain among the pregnant women in Odisha.

The current study also found the socio-cultural variation of MSDs pain during pregnancy, as the pain found in Urban was high 54.4%, compared to rural 45.6%, also highest in Hindu religion (92.7%). Also an important factors this study came with that as the pain increases the disability of life increase simultaneously, which reflected from Quebec Back Pain (QBP) disability score of pregnant women, ultimately affects the quality of life<sup>11-15</sup>.

In this study researcher only took the pregnant women who came for check-up at selected hospitals in Odisha. So for further study researcher strongly recommended to include other hospitals from all over country. In this study, musculoskeletal complaints of prenatal period only focused; so need for further research to explore the prevalence of musculoskeletal complaints in the postnatal period. It is recommended for further study to generalized physiotherapy treatment among the pregnant women to prevention and treatment of musculoskeletal complaints in women both in prenatal and postnatal period

## CONCLUSION

From this research, we conclude that among various musculoskeletal complaints during pregnancy, low back pain is the commonest of all, prevailing around more than half of subjects from our sample. For the ensuring of the generalizability of the research it is recommended to investigate with large samples.

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**Conflicts of Interest:** The authors declare that they have no competing interests.

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