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[1]MPT, Rehabilitation, Owner & founder of Nirlep Physiotherapy, clinic, Surat
[2]MPT, Sports, Physiotherapist, Vadodara
[3]Assistant professor, SPB Physiotherapy College, Ugat Bhesan road, Rander, Surat, Gujarat, India
Corresponding author:
Dr. Vandana J. Rathod, M.P.T, Ph.D. Scholar
Email:vannu6686@gmail.com
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EFFECT OF EXERCISE ON LOW BACK PAIN DURING PREGNANCY

Dr. Pallavi Patel[1], Dr. Gaurishankar[2], Dr. Vandana Rathod[3]

Abstract

Background:

Back pain during pregnancy may commence as early as the 12th week, although the fifth through seventh months are cited as the most common period for onset of back pain... Self-help' treatment or coping strategies may be appropriate forms of management and can be taught so that women are able to treat themselves.

Method

Ethical approval was taken. After ethical approval 17 pregnant women with back pain were assigned alternatively to two groups: Group A (control group) and Group B (experimental group). The baseline data were obtained from both the groups using Rolland Morris questionnaire and Visual Analogue Scale (VAS) for pain. The subjects of group A were explained about the life style modification with the use of pamphlet. They were advised to follow dos and don'ts at home as written in the pamphlet. The subjects of group B also received same pamphlet of home advice for do's-don'ts along with pamphlet of exercises.

Result

Comparison of VAS & RMQS for pain & Disability score before & after intervention in Group A and B is statically significant. Intergroup comparison of VAS (p=0.082) and RMQS (p=0.367) before intervention shows that there is no significant difference between the pretreatment values of VAS and RMQS. The post treatment values of VAS and RMQS were done with independent t test. The t value of inter group treatment for VAS is 0.141 and p=0.89.

Discussion

In this study, exercises were given with use of pamphlet to only one group and home advices were given with the use of pamphlet to both the groups. The effects of home advices were found as effective as those of exercises. It may be due to the fact that ergonomic enhancements may reduce back pain during pregnancy.

Conclusion

This study concludes that exercises with pamphlet are as effective as home advices with do's and don'ts in reducing pain and disability in low back pain during pregnancy.

Introduction

In India, every day 67,385 babies are born. According to UNICEF, (UNICEF: India 2022) it is sixth of the world's live child births. Many pregnant women have reported that LBP compromises their ability to work during pregnancy and interferes with their activities of daily living. [1, 2]

More than one-third of women experience back and pelvic pain at some stage during pregnancy. [3] Research indicates that, in about 50% of those pregnant women experiencing pain, it is of sufficient intensity and duration to affect their lifestyle in some way, and for one-third of these individuals the pain is severe. [4, 5] Recent researchers found that severity of back pain during pregnancy may have impact over the entire life of women. So prevention of back pain is an important issue to be handled which is related with the women's health and it is not only concerned with only pregnant women but also with overall health of women.

Back pain during pregnancy may commence as early as the 12th week, although the fifth through seventh months are cited as the most common period for onset of back pain. A previous history of back pain, back pain during a prior pregnancy, multiparity, and advancing age are the most commonly named risk factors. [6] Pregnancy makes changes in almost all the systems of the woman's body including endocrine, reproductive, cardiovascular, respiratory, gastrointestinal, nervous, urinary and musculoskeletal system. The influences of pregnancy on the musculoskeletal system are the ones that involve the physiotherapist most directly, first to attempt to prevent disorders arising and where problems do arise; to treat them. [7] Back pain during pregnancy can be significant in terms of intensity and resulting disability.

The female body is exposed to various factors during pregnancy that have an impact on the dynamic stability of the pelvis. One such factor is the effect of the hormone relaxin, which in combination with other hormones, affects the laxity of ligaments of the pelvic girdle as well as ligaments in the rest of the body. The effect of increased ligament laxity is a slightly larger range of movement in the pelvic joints. Mechanical stress from the gravid uterus and compensatory lordosis also contributes to the posterior pelvic pain and lumbar pain. [8] Explanations are linked to hormonal and biomechanical changes of pregnancy. Unfortunately, very few studies actually measure postural changes through pregnancy. Few studies supported increase in the lumber lordosis, whereas others have not or have shown a variable effect of lordosis during pregnancy. [9, 10] Unfortunately, survey studies are not able to describe the types of back pain. No other mechanical factors are responsible. Stress on ligaments and joints, joint laxity, and muscle fatigue can alone explain back pain in pregnancy.

Numerous treatments have been advocated for back pain during pregnancy, including exercise (such as encouraging maintenance of fitness as much as possible), use of proper ergonomics, heat and cold therapy, relaxation exercises, rest as needed, patient education on avoiding aggravating factors and encouraging relieving activities, joint mobilization, stretching, massage, acetaminophen (or other pain relieving medications), acupuncture, and chiropractic.[11] Two reviews of chiropractic care for LBP during pregnancy exist.[12,13] As a part of parental counselling, value of good posture as well as regular exercise should be implemented properly. This can be added with proper advice on resting

positions for comfort. Suggestions on back care and preventive pain strategies are available for the pregnant woman. [14] Because some standard examinations cannot be done and many treatment methods are contraindicated in pregnancy, it would be valuable for personnel involved in maternity care to be able to identify, in advance, women with a high risk of pregnancy-related LBP. Pharmacologic as well as complementary and alternative medicine (CAM) interventions have been suggested as treatments for LBP in the general population. However, most of the LBP treatments in the literature have primarily focused on and been intended for non-pregnancy-related LBP. [15, 16]

Frequently, a clear explanation, and consequent understanding, of the reasoning behind the symptoms will in the majority of cases be sufficient to enable the mother-to-be to 'manage' and cope with them. 'Self-help' treatment or coping strategies may be appropriate forms of management and can be taught so that women are able to treat themselves.[11]Both, basic and clinical research, needs to be focused on the mechanisms contributing to back pain in pregnancy. Evidences suggest that the impact of back pain in pregnancy is substantial. There are limited suggestive evidences of medications and electrotherapeutic modalities to relieve this pain because of suspected harm to the fetus. Usefulness of the exercises to help pregnant woman with low back pain is still controversial. So the aim of the study is to find out the effects of exercise with home advice and home advice alone over low back pain and the disability during pregnancy

Methods

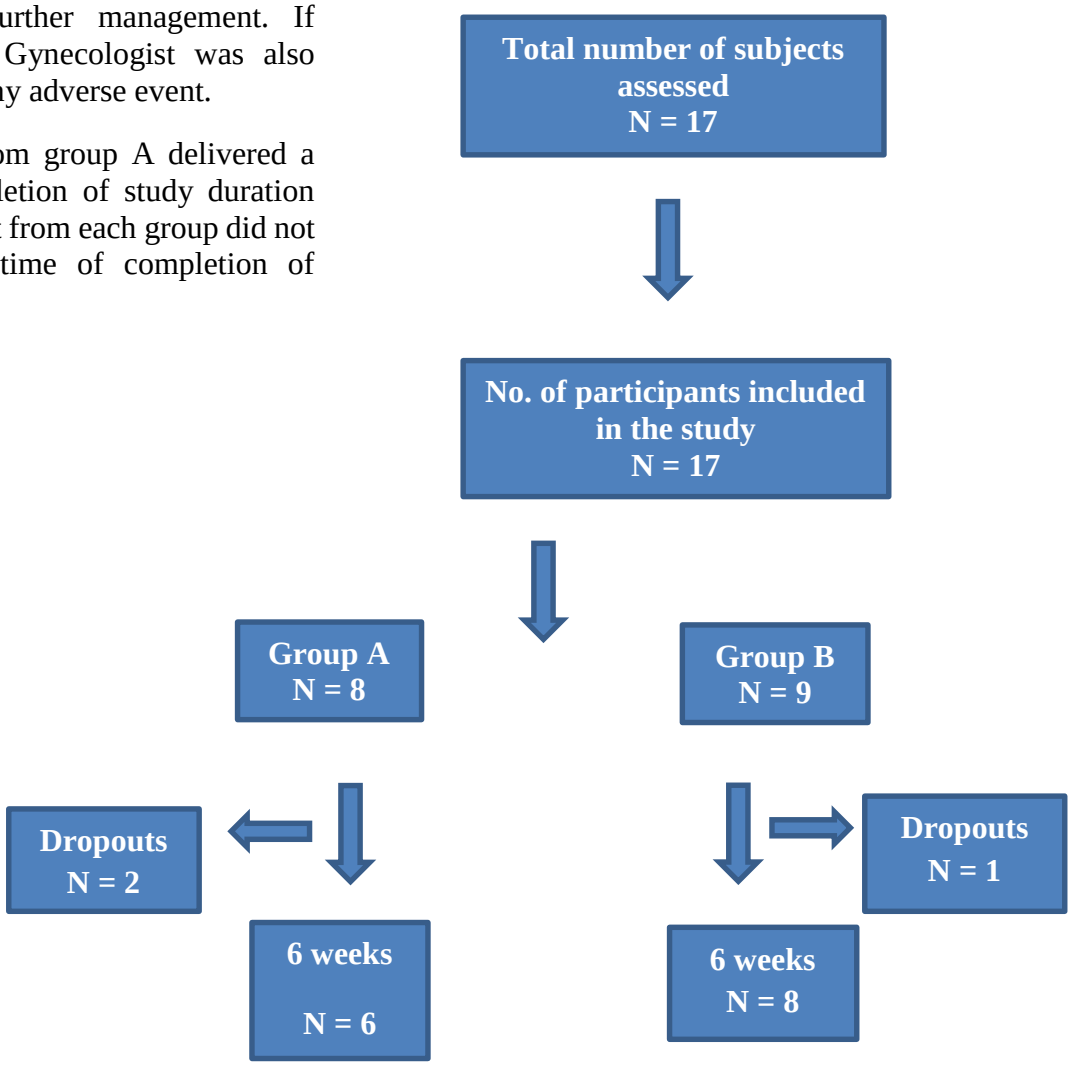
For the experimental study to conduct ethical approval was received from Suamandeep Vidyapeeth institutional Ethical Committee (SVIEC). Data was collected from outpatient department of obstetrics and gynecology of Dhiraj General Hospital, Piparia, Vadodara and Nisarg Orthopedic and Maternity Hospital, Vadodara. Primipara with age between 20-30 yrs., with 14-30 weeks of gestation with low back pain and Rolland Morris questionnaire score <14 were included in the study. At time of the routine antenatal visit, each pregnant woman was approached individually & records were reviewed, all primipara were approached & the detail enquiry of back pain during pregnancy was done on one to one basis. Women with high risk pregnancy, previous trauma particular to pelvic area, other musculoskeletal or cardio respiratory conditions and who cannot read Gujarati or English were excluded from the study.

The purpose and procedure of study were explained to the participants and informed consent was obtained. 17 pregnant women from Dhiraj General Hospital (n=15) and Nisarg Orthopedic and Maternity Hospital (n=2) with back pain were assigned alternatively to two groups: Group A (control group) and Group B (experimental group). The baseline data were obtained from both the groups using Rolland Morris questionnaire and Visual Analogue Scale (VAS) for pain.

The subjects of group A were explained about the life style modification with the use of pamphlet. They were advised to follow dos and don'ts at home as written in the pamphlet. The subjects of group B also received same pamphlet of home advice for do's-don'ts along with pamphlet of exercises. Exercises were demonstrated to the participants by investigator and confirmed that they were done correctly. The subjects were told to do the exercises daily. Each exercise (for abdominals, gluteus Maximus, latissimus dorsi, pelvic

floor and hip adductors) had 5 repetitions and was supposed to be done for three times a day. Subjects were given a log diary and were informed to record the number of times the exercises were actually performed in the log diary. During or after the period of exercise, if participants felt any discomfort, they were asked to discontinue the programme and immediately report to the investigator for further management. If required, help of Gynecologist was also sought in case of any adverse event.

One participant from group A delivered a baby before completion of study duration and One participant from each group did not visit hospital on time of completion of intended intervention and could not be communicated. So they were considered as drop outs. 6 participants from group A and 8 participants from group B were assessed to measure progression after 6 week of intervention by using VAS for pain and Roland Morris Questionnaire for Disability.



Exercises protocol

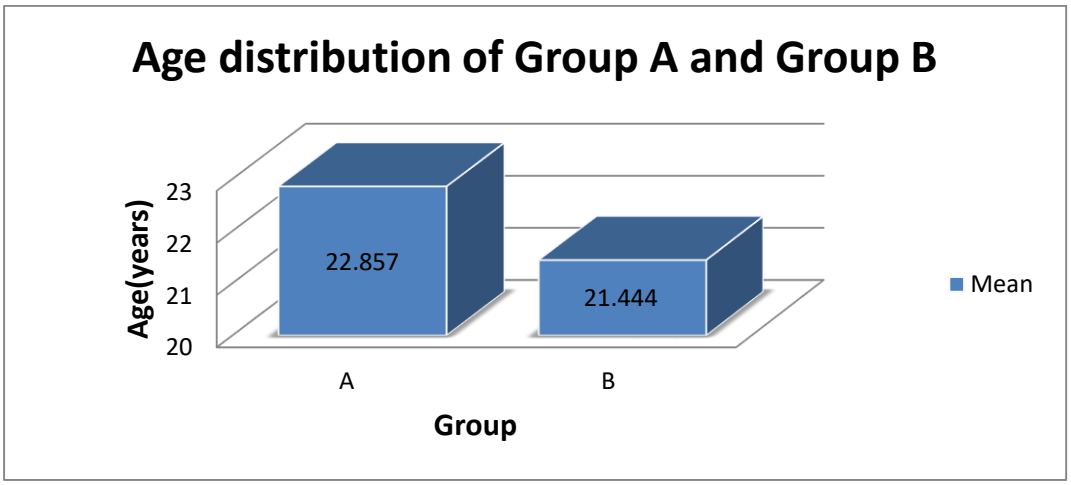
General exercises for	Home advice (do's and don'ts for) with using pamphlet
Abdominal stabilization	Getting into bed
Pelvic floor	Rolling over in bed
Gluteus maximus muscle	Getting up from a chair
Latissimus dorsi muscle	Sitting down
Hip adductor muscles	Walking
Sitting pelvic tilt exercise	Using stairs & what to remember and what to avoid

Statistical Analysis

All the statistical analysis was done by using SPSS 15 for windows software. Normal distribution of data was checked with Shapiro wilk test. The test was done with power level kept at 0.8. Intra group comparison for VAS and Roland Morris Questionnaire (RMQ) for Disability was done by using Paired t test for both the groups. Descriptive analysis for both groups was also done. The VAS and RMQ was analyzed for mean and standard deviation before and after intervention.

The inter group comparison for VAS and RMQ was done by using independent t test to check the homogeneity between two groups at the baseline. Independent t test was used to see the treatment effect between two groups for VAS and RMQ.

Result



Age distribution of participants in both group

INTRA GROUP ANALYSIS

PRE AND POST TREATMENT COMPARISON OF VAS & RMQS IN GROUP A

Table: 4.2 Pre and post treatment comparison of VAS for pain in group A

VISUAL ANALOGUE SCALE				
	Mean	±SD	t value	p value
Pre treatment	3.133	±0.273	5.966	0.002
Post treatment	2.033	±0.508		
RMQ DISABILITY SCALE				
Pre treatment	6.500	±1.048	7.050	0.001
Post treatment	4.333	±1.211		

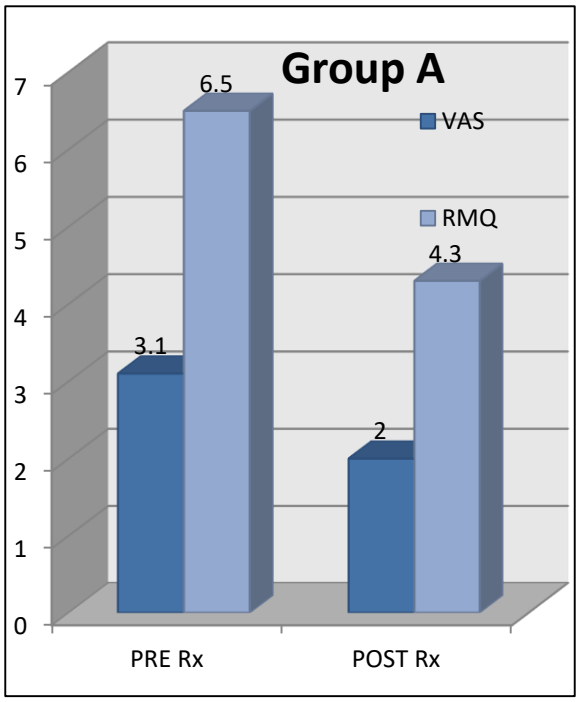
Comparison of VAS & RMQS for pain & Disability score before & after intervention in Group A

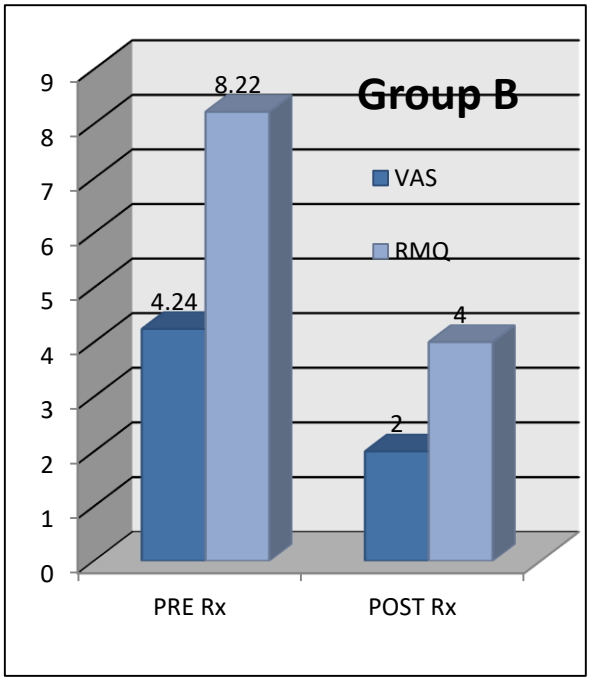
The p value being <0.001 indicates that home advice programme is statistically significant in reducing pain and disability in subjects with low back pain during pregnancy.

PRE & POST TREATMENT COMPARISON OF VAS & RMQS FOR PAIN & DISABILITY IN GROUP B

Table: 4.4 Pre and post treatment comparison of VAS & RMQS for Group

VISUAL ANALOGUE SCALE				
	Mean	±SD	t value	p value
Pre treatment	4.242	±0.820	7.687	0.000
Post treatment	2.042	±0.953		
RMQ DISABILITY SCORE				
Pre treatment	8.222	± 2.774	6.332	0.000
Post treatment	4.00	± 1.195		

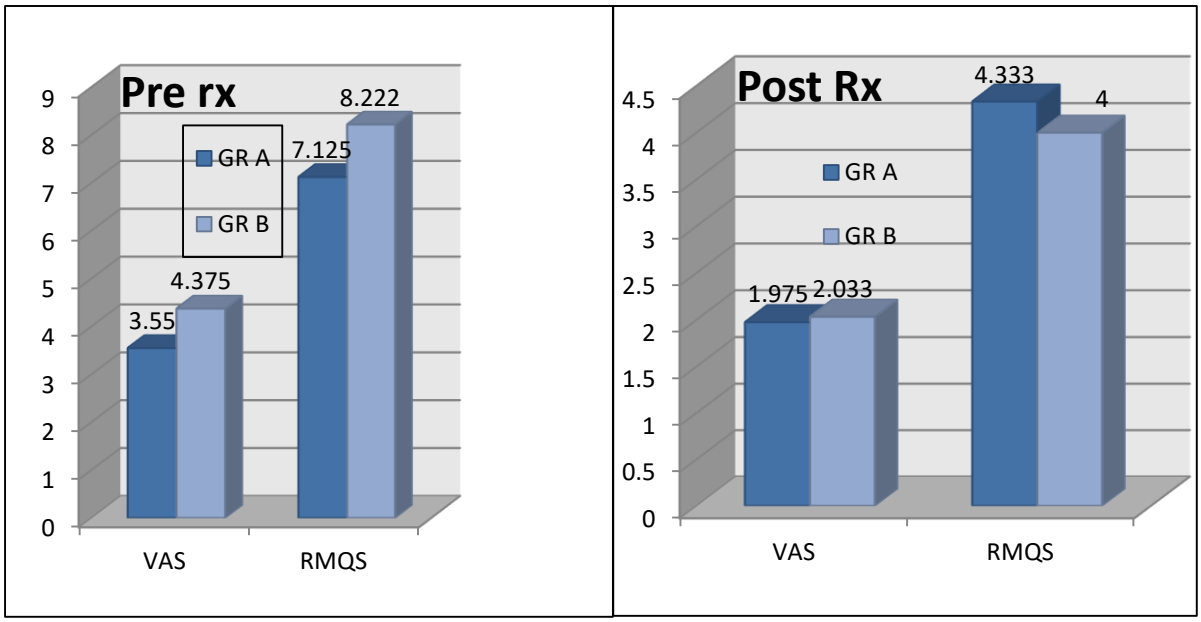




Comparison of VAS & RMQS for pain & Disability score before & after intervention in Group B Effect of exercises for low back during pregnancy is statistically significant in reducing pain and disability for Group B.

INTERGROUP ANALYSIS

PRE Rx GR COMPARISION FOR VAS				
GROUP	MEAN	±SD	t value	p value
A	3.550	±0.911	1.876	0.082
B	4.375	±0.846		
PRE Rx GR COMPARISION FOR RMQS				
A	7.125	±1.807	0.930	0.367
B	8.222	±2.862		
POST Rx GR COMPARISION FOR VAS				
A	1.975	±0.903	0.141	0.890
B	2.033	±0.508		
POST Rx GR COMPARISION FOR RMQS				
A	4.333	± 1.211	0.514	0.617
B	4.000	± 1.195		



Intergroup comparison of VAS (p=0.082) and RMQS (p=0.367) before intervention shows that there is no significant difference between the pretreatment values of VAS and RMQS. It proves the pretreatment homogeneity of both the groups before the intervention.

The post treatment values of VAS and RMQS were done with independent t test. The t value of inter group treatment for VAS is 0.141 and p=0.89 there is no significant difference in effect of exercise programme and home advice programme in reducing low back pain during pregnancy which is showing that there is no significant difference (p=0.617) in effectiveness of exercises and home advices in improving disability in low back pain during pregnancy. So null hypothesis is accepted.

Discussion

The purpose of this study was to check the effect of exercises in low back pain during pregnancy. The implication of this study

may justify the efficacy of exercises in the treatment of low back pain during pregnancy. Results of this study demonstrated that treatment of low back pain during pregnancy with proper dosage of exercise programme was efficacious. The outcome measures used were VAS for pain and Rolland Morris Questionnaire for disability.

The groups were synchronized with age and pretreatment scores of VAS (p=0.082) and RMQ disability scale (p=0.367). All the participants of one group were treated with exercise programme and various lifestyle modifications as home advice and those of another group were explained with home advice only. Beneficial effects were significantly found in both the groups for pain and disability.

Low back pain during pregnancy is very common and interfering with activities of daily living. To answer the question of type, frequency, and also dose of exercises, head to head comparisons in which participants are randomly assigned to receive different exercises are highly needed. Numerous theories propose effectiveness of various exercises in treatment of low back pain during pregnancy. [17] Various preventive measures for pregnancy related back pain have also been proved.[31]Results of these studies show small but significant reduction in low back pain. In this study exercises and home advices for do's and don'ts were given.

Various evidences are support exercise programme and also home advices. In this study one group was treated with exercise programme and home advice with do's and don'ts and other group was treated by home advices with do's and don'ts only. Total 6 weeks of intervention was given in this study. There was an equal improvement found in reduction of pain and disability in both the groups after the session.

The result of this led to inference that both exercises and lifestyle modifications are effective in reducing pain and disability in subjects with low back pain during pregnancy, but no differences found when comparison was made between home advice and general exercises programme. Numerous studies have come up with effective home advices with conclusion in treatment of pregnancy related low back pain. [18, 19]

Our trial does not provide information on the effectiveness of advice compared with no intervention, but other trials suggest that advice supported by a booklet is a useful intervention when compared with usual care given by a general practitioner as long as the information is reinforced by all involved in the patient's care. It would be useful to determine the long term effectiveness of such interventions in future studies. The result of this study may be applied to a population with multigravida during pregnancy.

Preventive intervention in form of exercise can be directed to high risk mothers to motivate them to be aware of self-treatment methods of low back pain during pregnancy.[53 This] study did not include long-term follow up period, though exercises are effective for long term benefits of the interventions. In this study, exercises were given with use of pamphlet to only one group and home advices were given with the use of pamphlet to both the groups. The effects of home advices were found as effective as those of exercises. It may be due to the fact that ergonomic enhancements may reduce back pain during pregnancy. E.g. When patients stand for long periods, placing one foot on a foot stool relaxes the iliopsoas muscles and tilts the pelvis forward, decreasing the strain on the lumbar spine and paraspinal musculature. [51] This would result in better improvement in pain and disability in low back pain.

This study provides evidence to support the exercises and home advices with do's and

don'ts in the management of low back pain during pregnancy.

Limitation &Future recommendation

The study includes very small sample size which may not prove the study results in terms of comparison. So future study is recommended with larger sample size.

Further studies could focus on the long-term benefits of physical therapy for this condition and the relative effectiveness of these treatment regimens compared with other approaches. Further studies can be conducted with randomized control trial for the effectiveness of exercise programme in low back pain during pregnancy and also on multi gravida. The long term effects can be evaluated with these treatments in low back pain during pregnancy.

Conclusion

This study concludes that exercises with pamphlet are as effective as home advices with do's and don'ts in reducing pain and disability in low back pain during pregnancy.

Ethical Approval

Suamandeep Vidyapeeth institutional Ethical Committee (SVIEC)

Conflict of interest

Nil

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