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COST-EFFECTIVE MANAGEMENT OF PREGNANCY-RELATED BACK PAIN IN LOW-RESOURCE SETTINGS

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Abstract: Pregnancy-related back pain poses a significant health challenge globally, affecting approximately 25% of pregnant individuals, with nearly half continuing to experience discomfort postpartum. While often categorized as mild, around one-third of women endure severe pain, with onset possible at any stage of pregnancy. This phenomenon stems from a complex interplay of mechanical, hormonal, circulatory, and psychosocial factors. Despite its prevalence and impact, effective management strategies remain elusive, necessitating a comprehensive understanding of its etiology and implications for maternal health. This review synthesizes existing literature on pregnancy-related back pain, exploring its multifaceted nature and potential interventions to alleviate its burden on expectant and new mothers.

Keywords: medical errors, patient safety, healthcare, medication errors, hospital-acquired infections, patient monitoring, healthcare communication, healthcare quality.

INTRODUCTION

Pregnancy-related back pain is a frustrating health experience back pain during pregnancy and 25% may problem worldwide as approximately 50% of women continue to experience pain after delivery (Davenport et al., 2019). Although, most cases are mild, approximately one-third of women experience severe pain and onset can be at any point of pregnancy (Weis et al., 2018) and the cause of pregnancy related back pain can be due to a combination of mechanical, hormonal, circulatory, and psychosocial factors (Chang et al., 2014; Katonis et al., 2011). While readings have shown that prevalence drops significantly to 35% in the first month after delivery and stabilizes directly thereafter, there is a good chance that untreated back pain will result in disability and chronic pain (Casiano et al., 2023; Bastiaanssen et al., 2005). However, there is no clear understanding into the severity of pain, limitations in activities of daily living (ADLs) and participation restrictions in pregnant women with back pain. This is because experiences comprising pain, fatigue and a feeling of instability in the pelvic girdle that begin during pregnancy remain subjective and therefore require different treatment strategies (Davenport et al., 2019). Exercise appears to have a slight positive impact on back pain severity in the general population when compared with standard care, which is equivalent to the efficacy of other non-pharmacological therapies suggested for the management of acute or chronic back pain (Chou et al., 2017). Exercise during pregnancy has previously been advocated due to its benefits for overall wellbeing, and a decreased risk of pregnancy-related

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issues (Berber and Satılmış, 2020; Vleeming et al., 2008). Few studies have focused for instance on specific stabilizing exercises with a positive result (Mens et al., 2012). However, there are still gaps in the literature regarding the effects of prenatal exercise on back pain because of inconclusive outcomes. Nonetheless, it has been revealed that 8 to 12 weeks of exercise poses a reduced risk of pregnant women reporting back pain by 44% and sick leave by 24% (Weis et al., 2018). But there is a little scientific appraisal on self-management treatment programs on back pain during pregnancy available. In Low- and middle-income countries (LMICs) exercise for pregnant women with back pain suggests a practical approach because exercise is easily accessible as part of a self-management strategy as it requires minimal equipment and can be performed at home. In addition, Nkhata et al. (2016) in Zambia a LMIC country revealed that pregnant women attending antenatal care had positive attitudes towards participation in exercise during pregnancy. Similar, outcomes reported in Brazil (Riberio and Milanez, 2011), Malaysia (Sujindra et al., 2015) and Nigeria (Mbada et al., 2015) echoed a positive paradigm shift in the attitude towards exercise during pregnancy with increasing numbers of pregnant women participating in exercise and physical activities. This denotes that exercise should be encouraged and promoted because pregnant women are willing to partake in these activities during pregnancy. Back pain is among the persistent health issues that self-management is advised for (Crowe et al., 2010; Dickson and McDonough, 2018). People are given the resources they require to better understand their own health needs, increase their level of awareness, and exert active control over their own health (McCabe et al., 2018). The paper reports on the impact of self-management education and exercise intervention on pregnant women's back pain experiences in a Low- and middle-income setting. This study also aimed at establishing the women's back pain disability scores before and after the intervention activities.

MATERIALS AND METHODS

A pre-post-test single sample design was conducted because of logistical difficulties that arose in conducting a randomized control trial. However, this design helped to establish general trends, reduced the time and resources needed for testing. Conversely, the impact and benefits of the intervention in the study population due to pre and post intervention measurements were highlighted by this design (White and Sabarwal, 2014).

Study setting

This study was carried out in a public health facility in Lusaka, Zambia, a nation with limited resources. The tertiary-level facility offers both inpatient and outpatient services, as well as public health initiatives like COVID19 vaccinations, tuberculosis, HIV, and AIDS programs (MoH, 2022). Because it is easily accessible and a sizable portion of the general public uses its services, the facility was specifically chosen as a study site.

Sample size and sampling method

All pregnant women who were in the 2nd trimester of gestation and were receiving antenatal care at the facility, regardless of their back-pain status during the study period participated in the study population. This is because back pain typically starts in the second trimester at gestational average of 22 weeks (Katonis et al., 2011). It is estimated that one-third of women experience significant pain, with reports indicating difficulty in sleeping, poor quality of life and being unable to work effectively (Berber and Satılmış, 2020). Between February and March 2021, the facility provided antenatal care to about 160 women who were in the second trimester (MOH, 2022). Using McNemar's paired differences calculator with an 80% power and 5% significance level, a sample size of

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34 was established (Dhand and Khatar, 2014). Pregnant women who were willing to participate in the study were found and enlisted with the aid of the outpatient department registries. The authors excluded high-risk expectant mothers whose medical histories included, to name a few, anemias, persistent bleeding, cardiovascular disease, and multiple gestations.

Intervention description

Studies by Shah et al. (2015) have shown that pregnant women who participate in both education and exercise therapy for back pain discomforts experience less pain impairments and a higher quality of life. To preserve functional stability throughout pregnancy, the muscles that surround the lumbar spine can be strengthened through a variety of back exercises. A postural awareness and physical activity class was required of the participants for 12 weeks, at least three times a week. Every session began with an information/education session on various components of exercise including benefits. The actual physical activity program comprised a five-minute warm-up, followed by 10 min of strength training with particular emphasis on the deep abdominal stabilizing muscles, pelvic floor, and back muscles. Stretching and activities focusing on body awareness were done after this, and the final 5 min of the workout were spent cooling down. A summary of the intervention activities in accordance with American Congress of Obstetricians and Gynecologists, (2015) exercise prescription is provided in Table 1. These activities were tracked on a personal record card which the authors inspected.

Table 1. Summary of intervention activities.

Supervised program activities	Exercise activity	Intensity	Frequency
1) 10 min Information and education section	1) Deep abdominal stabilizing muscles	Moderate intensity rated by exertion	3 times per week for 12 weeks
2) 5 min warm-up	2) Pelvic floor exercises	-	-
3) 10 min strength training, stretching and body awareness activities	3) Back strengthening	-	-
4) 5 min cool down activities	4) Stretching and body awareness	-	-
Home program activities			
1) 30 min of moderately paced ADLs	1) Walking	Moderate intensity rated by exertion	3 times per week for 12 weeks
-	2) Housework		

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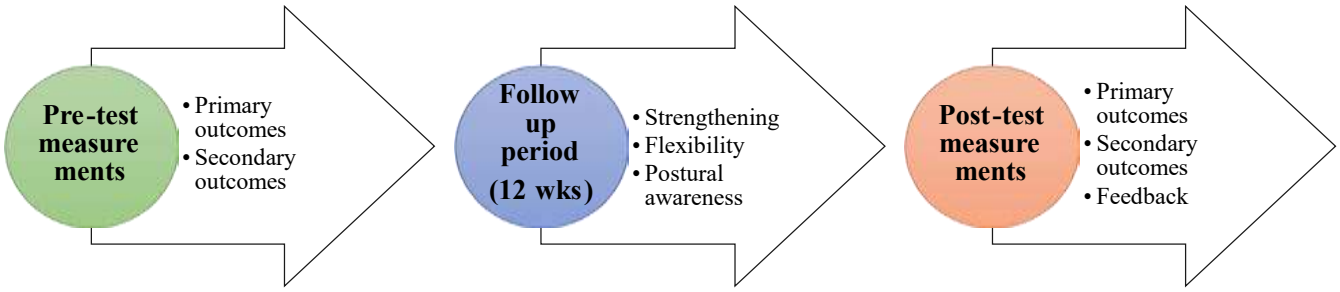

Figure 1. Study follow-up diagram.

Data collection and outcome measurements

Measurement time-frames for primary and secondary outcomes were at baseline and again at exit after the 12week follow-up ended (Figure 1). The number of women reporting back pain after the intervention (13th week) served as the primary outcome indicator. Limitations on engaging in daily activities and physical activity were secondary outcomes. Demographic data was collected using a data captures form and included age, educational level, occupation, parity, height and maternal weight. In addition, participants were asked to indicate whether they had any back experience, its location, and nature of symptoms. Using the Oswestry Disability Index Questionnaire (ODIQ), participants were asked to report about the severity (mild, moderate or severe) of their back pain and its ability to limit their activities of daily living. The ODIQ is a crucial tool for measuring level of function (disability) in activities of daily living in those rehabilitating from back pain (Garg et al., 2020). The questionnaire is self-administered and examines the level of disability in everyday activities of daily living such as, pain intensity, personal care, lifting, walking, sitting, standing, sleeping and sex if applicable. Each item consists of 6 statements which are scored from 0 to 5. With 0 indicating the least disability and 5 the greatest then the total score is calculated as a percentage, with 0% indicating no disability and 100% indicating the highest level of disability (Garg et al., 2020).

Data analysis

Frequencies and percentages were used to describe the sample characteristic using IBM SPSS version 20.0 for windows. For all of the ODIQ items, the responses were descriptive analytical method. This technique allowed for a comparison of the selected items to check for variations in the primary and secondary outcomes before and after the intervention. The intervention feedback was also provided in a descriptive manner using percentages of the total responses.

Table 2. Participants' demographic descriptions (N=34).

Variable	Mean (SD)	%
Age (years)		
20-25	29.6	
26-30		

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31-35

Anthropometric measurements		
Weight (kg)	75.6	
Height (cm)	160.5	
BMI (kg/m^2)	29.7	
Educational level		
Primary		20.6
Secondary		32.4
Tertiary		47
Occupational status		
Unemployed		29.4
Formal employment		32.3
Businesswoman		38.2
Parity		
1		23.5
2		41.2
3		35.3

Examined using a

Ethical considerations

Before participating in this study, each participant gave their written informed consent. The study, received ethical approval and clearance from University of Zambia Health Sciences Research Ethics Committee, the National Health Research Authority and the participating hospital.

RESULTS

Participants' demographic descriptions

The median age of the participants, shown in Table 2, was 29.06, their average weight was 75.06, and their height was 160. The majority of participants (47%) had completed their tertiary education, 38% of whom were businesswomen, and 41% of whom reported having two children.

Participants back pain experience

Results in Table 3 demonstrate that after the intervention, the proportion of participants reporting back pain dropped from 36.2% (pre-intervention) to 29.1% (post-intervention) at 95% CI [0.2, 0.5]. As for the location and type of symptoms associated with back pain, there were decreases in both percentages.

Participants' Oswestry Disability Index score and feedback on the physical activity programed

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Table 4 shows that, prior to the intervention, 52% of the participants scored moderately disabled on the ODIQ. The percentages of those who scored severe and moderate disability decreased but increased for those who scored minimal disability after the intervention, indicating positive changes in all categories. Nearly all participants gave the physical activity program for back pain positive feedback. The majority of the participants also said that the program had an effect on their goals for back care and suggested that the initiative be added to the facility's regular antenatal care.

DISCUSSION

Regular exercise has been shown to improve physical health and wellbeing in the general population by reducing the effects of back pain. However, due to the need to

Table 3. Participants' back pain experience.

Participants' back pain experience	Before (%)	After (%)	95% CI
Experienced back pain Yes			
	36.2	29.1	[0.2, 0.5]
No	63.8	70.9	[0.5, 0.8]
Location of back pain			
Lumbar region		13.8	[0.51, 0.81]
Sacral region	66.7	78.7	[0.63, 0.9]
Not-specified	33.3	7.5	[0.03, 0.2]
Nature of symptoms			
Lower back	58.3	50.5	[0.3, 0.7]
Radiates to the legs	16.7	35.7	[0.2, 0.5]
Not-specified	25	13.8	[0.26, 0.58]

Table 4. Participants Oswestry Disability Index Questionnaire score (N=34).

As a result, the ODIQ score revealed that more women had lower pain intensity and higher functional ability post intervention. This implies that pregnant women with back pain may more readily adopt the education and exercise programs as the intervention activities appeared to minimize the severity of back pain and enhance their functional abilities.

In the present study, the participants' average age was 29.6 years, and most of them were business women with tertiary degrees, according to study findings on demographic descriptions of the group. These results might explain why we saw a decrease in the percentage of women reporting back pain and the decline in disability scores. It is anticipated that older women with tertiary education will comprehend the principles of physical activity more fully and will be better able to manage their own back pain experiences. Likewise, Liu et al. (2011) and Hailemariam et al. (2020) revealed that women with higher levels of education were more active than those with non-formal education because they had access to more information about the advantages of physical activity during pregnancy. From our study outcomes, we also assumed that having their own business would give

participants more freedom in deciding when to fit in the necessary physical activities that were prescribed for them. In a similar vein, Hailemariam et al. (2020), highlighted that highly educated women and those with non-formal employment may have spent less time on household or work-related tasks during their pregnancies thereby giving them more time on leisure and exercise related activities.

Despite the fact that this study was conducted in a setting with limited resources, the study outcomes add to the body of knowledge and increases the relevance of research in this field. The majority of participants had positive things to say about the back-pain education and exercise program. Furthermore, participants also reported that the program had a positive impact on their pregnancy-related physical activity and back care goals. Thus, they recommended that the initiative be included in the health facility's regular antenatal care programs. The results of this study, however, are based on participant self-reported, subjective data. Therefore, it is important to consider the possibility of response bias. In addition, the results of this study cannot be generalized to other settings or to women even though some aspects may be similar because it was conducted on a small number of people in a public facility.

Conclusion

Results from a 12-week education and exercise program based on the ACOG (2015) recommendations during the second trimester of pregnancy revealed a decline in the number of participants reporting back pain and rating severe and moderate disabilities on the ODIQ. According to the study's findings, exercise has a number of beneficial effects, including improved sleep and pain relief, which raises participation in activities of daily living like lifting, sleeping, sitting, and standing. This backs up the widely accepted advice that pregnant women should be encouraged to exercise and kept up to date on the importance of exercise during pregnancy. The provision of context-relevant physical activity guidelines and information on the advantages of physical activity for pregnant women should be taken into consideration by policymakers and other stakeholders.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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