



Cross-sectional Study

Level of activity limitations and predictors in women with pregnancy-related pelvic girdle pain: Prospective cross-sectional study



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ABSTRACT

Background: For many pregnant women, pelvic girdle pain caused by pregnancy has an impact on their daily living. Women with lumbo-pelvic pain have moderate to severe discomfort that makes daily activities like getting out of a chair, bending, and walking difficult. The aim of this study was to determine the extent of daily activity restrictions and to discover predictors of pregnancy-related pelvic girdle pain.

Study design: Prospective cross-sectional study.

Methods: This prospective cross-sectional study was undertaken from January October 2018 to October 29/2019 among 337 gravid mothers with pregnancy-related lumbo-pelvic pain. A structured questionnaire adapted from the activity limitation-related pelvic girdle pain questionnaire was used for data collection. Epi-info version 7.1 for data entry and STATA version 14 for statistical analysis were used. Ordinal regression with an odds ratio of 95% confidence interval and p-value < 0.05 were cast-off to assess the association between the outcome and dependent variables.

Results: Among 324 pregnant women with pelvic girdle pain 96 (29.6%) had small extent level of activity limitation, 185 (57.1%) had moderate activity limitation, and 43 (13.3%) large extent level of activity limitation. Having previous children (AOR = 0.37, 95% CI:0.14, 0.98), occupation (AOR = 1.77, 95% CI: 1.06, 2.95) and taking alcohol (AOR = 0.43, 95% CI: 0.19, 0.99) were the independent predictors for activity limitation.

Conclusion: Nearly one-third of the participants had a modest degree of activity restriction, while more than half of the pregnant women with PGP had a moderate to high level of restriction. Previous children, occupation, and alcohol consumption were all independent predictors of activity limitation among pregnant women.

1. Introduction

Gestation is related to numerous biological and biomechanical changes [1–3]. During pregnancy, a woman's body goes through a variety of changes, including weight increase, changes in posture, joint, and ligament laxity, and changes in musculotendinous strength [4,5]. Postural deviations are caused by biomechanical changes that occur

during pregnancy, resulting in a variety of musculoskeletal pain syndromes [1]. The pain of musculoskeletal origin over the anterior and posterior parts of the pelvic region of pregnant women, between the levels of the posterior iliac crest and the gluteal fold, is referred to as pregnancy-related pelvic girdle pain [6,7].

Pelvic girdle pain (PGP) and low back pain (LBP) are two prevalent pain syndromes related to pregnancy that are reported by pregnant

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women all over the world [8–10]. According to the European guidelines PGP can be defined as: “Pelvic girdle pain that generally arises in relation to pregnancy, trauma, arthritis, and osteoarthritis. Pain is experienced between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the sacroiliac joints; and the pain may radiate in the posterior thigh and can also occur in conjunction with/or separately in the pubis symphysis [7].

In a systematic evaluation of twenty-eight studies, the average reported prevalence of pregnancy-related pelvic girdle discomfort was 45.3%, ranging from (3.9–89.9%) [11–13]. In Ethiopia, the annual prevalence rates of PPGP were reported to be 24.3% [14]. Many pregnant women experience pelvic pain as a result of their pregnancy [15]. Pregnant women’s health-related quality of life is reduced by PGP, notably in the physical, psychological, and social dimensions [16].

PGP is a common maternal morbidity that has a severe impact on women’s health throughout pregnancy and can last far into the post-partum period [9]. PGP impairs daily tasks such as getting out of a chair, bending, and walking, and women with it report moderate to severe discomfort [17]. The ability to do housework, care for children, and execute work obligations is all dented, with PPGP being the leading cause of sick leave during pregnancy [6]. Both during and after pregnancy, PPGP can transmit self-limiting symptoms of short duration during pregnancy to severe pain and activity limitation [18,19].

Women during pregnancy reported limitations in activities of daily life; furthermore, significantly reported limitations in physical abilities. Women during antenatal care, those linked to physiotherapy clinics as a result of PPGP, reported a considerable level of complaints in activities of daily living such as walking, standing, sitting, lying down, and changing position [15,20]. A high proportion of women with PPGP could no longer carry out activities such as lifting, carrying, and vacuum cleaning by themselves [19]. On the other hand, low-grade activity limitation was reported by the majority of women with PPGP in late pregnancy [21].

Despite the vague pain, pregnant women have a poor quality of life, frequent sick days, functional impairments, absenteeism, disability, and a high health-care expense. In order to select appropriate treatment approach, it is necessary to assess the effects of PPGP in terms of activity and functional limitation during the rehabilitation process. Furthermore, there is a scarcity of data and expertise about the level of disability and activity limitation experienced by pregnant women with PPGP. Hence, the aim of this study was to determine the level of activity restriction and parameters linked to PPGP in Ethiopian pregnant women.

2. Material and methods

2.1. Study design, period, and area

This prospective cross-sectional study was conducted from January 10th, 2018 to October 29th, 2019 among pregnant women who complained of PPGP during antenatal care follow-up (ANC) at the University of Gondar comprehensive specialized hospital and were referred to the physiotherapy outpatient department (OPD), which is located in the northern part of Ethiopia. According to the 2016 population estimates of the Gondar city administration bureau, Gondar had a total population of 335,000 people, with a density of 3200 people per square kilometer, a total household count of 53,725 people, and among them, 18,200 were women [22].

The Ethiopian health system provides free health services to all pregnant women in a public health setting, and the majority of them seek out maternity care units. The hospital features a prenatal clinic that provides daily antenatal treatment and a physiotherapy clinic that opened in 2002. Approximately 10–20 pregnant women visited the physiotherapy OPD per day because of pelvic girdle pain and pregnancy-induced musculoskeletal issues, with over 20,000 pregnant mothers visiting the hospital for ANC services each year.

2.2. Study participants, procedure, and sample size

Pregnant women who had been diagnosed with PPGP in a Gondar comprehensive specialty hospital were included in the study population. During the data collecting period, all expecting mothers with PPGP aged 18–40 years who were consulted for physiotherapy services during any trimester of pregnancy were included in the study population. Women with PPGP who had substantial non-musculoskeletal pathology, such as pre-eclampsia, eclampsia, serious intellectual or psychiatric impairment, systemic disease(s), or recent spinal fracture, trauma, or surgery, as determined by their medical records, were excluded from the study to prevent overestimation of the outcome.

The sample size was calculated using Epi Info 7; A total of 337 study participants were participated in the study by using a single population proportion formula [23] with systematic sampling methods.

2.3. Data collection tools and procedures

The data was collected using a structured questionnaire (Additional file 1) based on the activity limitation related pelvic girdle pain questionnaire (PGQ), which had high intra-class correlation coefficient estimates: 0.93 (95% confidence interval 0.86–0.96) for the PGQ activity subscale and 0.91 (95% confidence interval 0.84–0.95) for the PGQ symptom subscale [6,12]. The Pelvic Girdle Pain Questionnaire (PGQ) is a condition-specific tool that evaluates activity restrictions and symptoms in individuals with pelvic girdle pain. It was created for women experiencing pelvic girdle pain during pregnancy and after delivery, and it can be utilized in both research and clinical treatment [18].

This questionnaire consists of 20 activity items and 5 symptom items on a 4-point response Likert scale. The Likert scale responses for PGQ items are; not at all ‘0’, to a small extent ‘1’, to some extent ‘2’, and to a great amount ‘3’. The results were summed and converted to percentage values ranging from 0 (no problem at all) to 75 (to a large extent).

Interviews, patient record reviews, and physical examinations were used to gather information. Three musculoskeletal physiotherapists from the women’s health unit took part in the data collection during the first visit on the physiotherapy, which was overseen by two senior physiotherapist supervisors.

2.4. Operational definition of outcome variable

Level of activity limitation according to PGQ: A pregnant woman who reported limitation of activity of daily living due to PPGP; not at all actively limited ‘0’, to small extent activity limited with a total score of PGQ 1 to 25, to moderate extent activity limited 25 to 50 and to large extent activity limited with total score range from 50 to 75 [18].

2.5. Data processing and analysis

Data was double-checked for accuracy before being entered into Epi-Info version 7.1, which was then exported to STATA version 14.0 statistical software [24] (StataCorp LP) for coding, recoding, storage, and analysis. The statistical association was assessed using an ordinal regression model, and the significance of the statistical association was secured or evaluated using a 95% confidence interval and a P value of less than 0.05. The assumption of the proportional odds was tested. Finally, this study was reported in accordance with the STROCSS statement checklist [25] (Additional file 2) and registered at www.researchregistry.com with research registry UIN 7756.

3. Results

3.1. Maternal socio-demographic characteristics

This study included 324 women with PGP ranging in age from 18 to 40 years old, with a mean age of (26.77 ± 4.4 years). This is a response

rate of 96.1%, which is higher than the power calculated sample size (n = 306). Two hundred and thirty (67.9%) of the respondents were between the ages of 25 and 35 years. The majority of the participants (95.4%) were married, with more than half (54.3%) having children. 65.4% of the participants reported good work satisfaction, followed by fair work satisfaction (13.3%). The maternal socio-demographic characteristics of pregnant women are presented in (Table 1).

3.2. Maternal obstetrics related characteristics

About one-third (33.3%) of the participants were in their second trimester. The study participants had a mean and standard deviation

Table 1
Maternal Sociodemographic characteristics of pregnant women with pregnancy-related pelvic girdle pain, Gondar, Ethiopia (n = 324).

Variables	Categories	Frequency (n)	Percent (%)
Age in years (Mean age (26.77 ± 4.4)).	18–24	94	29.0
	25–35	220	67.9
Residence	Greater than 35	10	3.1
	Urban	279	86.1
	Rural	45	13.9
Marital status	Married	309	95.4
	relationship but not married	11	3.4
Religion	Others +	4	1.2
	Orthodox Christian	283	87.3
	Muslims	33	10.2
	Others ++	8	2.5
Occupation	Housewife	155	47.8
	Farmer	12	3.7
	Civil servant	77	23.8
	Merchant	42	13.0
	Unemployed	9	2.8
	Others*	29	9.0
	work status in week/hour	None	7
work type	0–20 h	131	40.4
	20–40 h	90	27.8
	more than 40 h	96	29.6
	very heavy	6	1.9
work satisfaction	Heavy	42	13.0
	Fair	137	42.3
	Light	124	38.3
	Very light	15	4.6
	very bad	3	0.9
Level of education	Bad	9	2.8
	Fair	43	13.3
	Good	212	65.4
	Very good	57	17.6
	No formal school	73	22.5
	Primary school	69	21.3
Income (ETB/month)	Secondary school	62	19.1
	Diploma	62	19.1
	Degree and above	58	17.9
	<1000	79	24.4
	1000–2000	73	22.5
Smoking habit	2001–3000	69	21.3
	>3000	103	31.8
	Never	322	99.4
Drinking alcohol habit	Past smoker	1	0.3
	Current smoker	1	0.3
	Never	226	69.8
Physical exercise	Past alcoholic	24	7.4
	Current alcoholic	74	22.8
	Never	74	22.8
Self-rated health status	No	250	77.2
	Yes	74	22.8
	very good	162	50.0
	Quite good	96	29.6
	Fair	37	11.4
work status in week/hour	Quite poor	24	7.4
	Poor	5	1.5

+--divorced and singles; ++-protestant, catholic; *-students and daily labours.

gestational week of (31.6 ± 6.9). The majority of pregnant women (91.1%) had a planned pregnancy and no history of abortion (93.2%). Three hundred and three (43.5%) of women experiencing pelvic girdle pain during pregnancy had not used any anti-pain medication. The obstetric features of pregnant mothers with PPGP are shown in Table 2.

3.3. Level of activity limitation among pregnant women with pregnancy related pelvic girdle pain

Out of 324 pregnant women with PGP had 96 (29.6%) of small extent level of activity limitation, 185 (57.1%) had moderate activity limitation, and 43 (13.3%) large extent level of activity limitation. The severe activity limitation was significantly higher in the third trimester (28.5%) followed by the second trimester (14.3%). In all level of activity limitation, the activity limitation due to pregnancy-related pelvic girdle pain significantly reported in the age ranged between 25 and 35 years. The activity restriction was higher among urban dwellers (77.2%) and women who did not report engaging in the recommended amount of physical activity (86.1%). Table 3 shows the level of activity limitation among pregnant women with pelvic girdle pain.

3.4. Ordinal regression analysis

Residence, have children, number of children, occupation, alcohol, work satisfaction and work hours per week were statistically significant with level of activity limitation (P-value < 0.2) in the bivariable ordinary logistic regression model. In the multivariable proportional odds model; not children, occupation and alcohol were significantly associated with the odds of large levels of activity limitation among pregnant women with PGP (P-value < 0.05). When compared to their counterparts, the odds of being at a greater level of activity limitation among pregnant women with PGP who had no children were reduced by 63% (AOR = 0.37, 95% CI:0.14, 0.98). Pregnant women who worked outside had 1.77 times (AOR = 1.77, 95% CI: 1.06, 2.95) higher chance of having a higher level of activity restriction than pregnant women who worked inside. When comparing pregnant women with PGP who had

Table 2
Obstetrics related characteristics of pregnant women with PPGP; Gondar, Ethiopia (n = 324).

Variables	Categories	Frequency	Percent (%)
Gestational weeks	1st trimester	1	0.3
	2nd trimester	108	33.3
	3rd trimester	215	66.4
Previous gravidity	No	148	45.7
	One	88	27.2
	Two	52	16.0
	Three and above	36	11.0
Do you have children?	No	148	45.7
	Yes	176	54.3
History of abortion	No	302	93.2
	Yes	22	6.8
Pattern of current pregnancy	Planned	295	91.1
	Unplanned	29	8.9
Taking medication	No	303	43.5
	Yes	21	6.5
History of back pain	No	113	34.9
	Yes	211	65.1
How much experience PPGP in morning	Some	256	79.0
	Moderate	53	16.4
	Considerable	15	4.6
How much experience PPGP in evening	Some	165	50.9
	Moderate	112	34.6
	Considerable	47	14.5

PPGP-pregnancy related pelvic girdle pain; wk-weeks.

Table 3
Level of activity limitation among pregnant women with PPGP; Gondar, Ethiopia (n = 324).

Variables	Categories	Level of Activity limitation (Based on PGQ)		
		Small n (%)	Moderate n (%)	Large n (%)
Age in years	18–24	27 (28.7%)	58 (61.7)	9 (9.6)
The mean ((26.77 ± 4.4))	25–35	66 (30)	124 (56.4)	30 (13.6)
Residence	>35	3 (30)	3 (30)	4 (40)
	Urban	87 (90.6)	157 (84.9)	35 (81.4)
Marital status	Rural	9 (9.4)	28 (15.1)	8 (18.6)
	Married	93 (96.9)	174 (94.1)	42 (97.7)
Religion	relationship but not married	2 (2.1)	8 (4.3)	1 (2.3)
	Others +	1 (1.0)	3 (1.6)	0 (0.00)
Occupation	Orthodox Christian	86 (89.6)	16 (87.0)	36 (83.7)
	Muslims	8 (8.3)	18 (9.7)	7 (16.3)
Work status in week/hour	Others ++	2 (2.1)	6 (3.3)	0 (0.00)
	0–20 h	31 (32.3)	79 (42.7)	21 (48.8)
Work type	20–40 h	32 (33.3)	49 (26.5)	9 (20.9)
	Very heavy	28 (29.2)	55 (29.7)	13 (30.2)
Work satisfaction	Heavy	2 (2.1)	2 (1.1)	2 (4.7)
	Fair	7 (7.3)	27 (14.6)	8 (18.6)
Level of education	Fair	42 (43.8)	77 (41.6)	18 (41.9)
	Light	39 (40.6)	72 (38.9)	13 (30.2)
Income (ETB/month)	Very light	6 (6.2)	7 (3.8)	2 (4.7)
	very bad	0 (0.00)	3 (1.6)	0 (0.00)
Smoking habit	Bad	2 (2.1)	4 (2.2)	3 (7.0)
	Fair	12 (12.5)	24 (13)	7 (16.3)
Drinking alcohol habit	Good	64 (66.7)	125 (67.6)	23 (53.5)
	Very good	18 (18.8)	29 (15.7)	10 (23.3)
Physical exercise	No formal school	20 (20.8)	38 (20.5)	15 (34.9)
	Primary school	21 (21.9)	40 (21.6)	8 (18.6)
Self-rated health status	Secondary school	23 (24.0)	33 (17.8)	6 (14.0)
	Diploma	15 (17.7)	44 (23.8)	3 (7.0)
Number of previous Pregnancies	Degree and above	17 (17.7)	30 (16.2)	11 (25.6)
	<1000	22 (22.9)	48 (25.9)	9 (20.9)
Do you have children?	1000–2000	26 (27.1)	40 (21.6)	7 (16.3)
	2001–3000	14 (14.6)	47 (25.4)	8 (18.6)
Taking medication	>3000	34 (35.4)	50 (27.0)	19 (44.2)
	Never	94 (98.0)	185 (100)	43 (100)
Do you have children?	Past smoker	1 (1.0)	0 (0.00)	0 (0.00)
	Current smoker	1 (1.0)	0 (0.00)	0 (0.00)
Do you have children?	Never	60 (62.5)	134 (72.4)	32 (74.4)
	Past alcoholic	10 (10.4)	13 (7.0)	1 (2.3)
Do you have children?	Current alcoholic	26 (27.1)	38 (20.5)	10 (23.3)
	No	74 (77.1)	145 (78.4)	31 (72.1)
Do you have children?	Yes	22 (22.9)	40 (21.6)	12 (27.9)
	very good	50 (52.1)	92 (49.7)	20 (46.5)
Do you have children?	Quite good	22 (22.9)	60 (32.4)	14 (32.6)
	Fair	14 (14.6)	23 (12.4)	0 (0.00)
Do you have children?	Quite poor	9 (9.4)	8 (4.3)	7 (16.3)
	Poor	1 (1.0)	2 (1.1)	2 (4.7)
Do you have children?	No	46 (47.9)	91 (49.2)	11 (25.6)
	One	28 (29.2)	47 (25.4)	13 (30.2)
Do you have children?	Two	15 (15.6)	26 (14.1)	11 (25.6)
	Three and above	7 (7.3)	21 (11.4)	8 (18.6)
Do you have children?	No	46 (47.9)	91 (49.2)	11 (25.6)
	Yes	50 (52.1)	94 (50.8)	32 (74.4)
Do you have children?	No	16 (64.0)	23 (74.2)	6 (60.0)

Table 3 (continued)

Variables	Categories	Level of Activity limitation (Based on PGQ)		
		Small n (%)	Moderate n (%)	Large n (%)
History of back pain	Yes	9 (36.0)	8 (25.8)	4 (40.0)
	No	32 (33.3)	64 (34.6)	17 (39.5)
How much experience PPGP in morning	Yes	64 (66.7)	121 (65.4)	26 (60.5)
	Some	90 (88.2)	135 (75.4)	21 (72.1)
How much experience PPGP in evening	Moderate	6 (5.9)	37 (20.7)	10 (23.3)
	Considerable	6 (5.9)	7 (3.9)	2 (4.7)
How much experience PPGP in evening	Some	78 (76.5)	84 (47.0)	3 (7.0)
	Moderate	18 (17.6)	74 (41.3)	20 (46.5)
How much experience PPGP in evening	Considerable	6 (5.9)	21 (11.7)	20 (46.5)

ETB-Ethiopian Birr; PPGP-Pregnancy related Pelvic Girdle Pain.

previously consumed alcohol to pregnant women who had never consumed alcohol, the odds of having a higher level of activity limitation were reduced by 57% (AOR = 0.43, 95% CI: 0.19, 0.99) (Table 4).

4. Discussion

This study, which is the first of its kind in Ethiopia, uses the PGQ to assess the amount of activity limitation associated with pregnancy-related pelvic girdle pain in women with PPGP and to identify the predictors. Our findings are alarming, all study subjects suffered daily activity limitations ranging from a little restriction to a significant restriction due to PPGP. Following PPGP based on PGQ, 29.6% of study participants reported some level of activity limitation, 57.1% reported moderate activity limitation, and 43 (13.3%) indicated a large amount of activity limitation. More than two-thirds of pregnant women urban dweller and more than three-quarters of young adults aged 25 to 35 indicated a significant level of activity limitation. This could be as a result of the observed frequency of urban dweller is high compared with rural participants and most study participant were with in the young adult age group. Several factors were found to be associated with significant activity limitation. Having previous children, occupation and taking alcohol were the independent predictors for activity limitation.

Pregnant women who were diagnosed with PPGP had a considerable restriction on their regular activities. Nearly one-third of the study participants were reported low level of activity limitation while more than half pregnant women with PPGP had moderate to high level of activity limitation. These findings are in line with those of earlier research that found that pregnancy reduced quality of life without taking into account pregnancy-related back pain and PGP [26,27]. This implies that the addition of PGP which related to pregnancy had a significant impact on activity and functional limitations.

This study also showed that the odds of being at higher level of activity limitation among pregnant women with PGP who had no children were decrease by 63% as compared to their counterpart primiparous women. This conclusion is consistent with the findings of other investigations [28–30]. This is because women who have a larger number of children need to be more active and higher energy expenditure.

Women with PPGP who had outdoor work were 1.77 times higher odds of having a higher level of activity limitation than Pregnant women whose worker indoor. This result is supported by the finding of other studies [30] [–] [32]. This could be owing to the lack of labor-saving technology in Ethiopia, which causes daily outdoor activities to consume more energy. Another factor could be that because majority of Ethiopia is at a high elevation, equal activity needs more effort and energy than at sea level. As a result, Ethiopian women have a high energy expenditure, which may greatly surpass their calorie intake.

In addition, those women with the odds of having a higher level of

Table 4
Factors associated with activity limitation among pregnant women with PPGP; Gondar, Ethiopia (n = 324).

Variables	Level of Activity limitation			Univariate COR (95%CI)	Multivariate AOR (95%CI)	P-value
	Small	Moderate	Large			
Residence						
Urban	87	157	35	1 ref	1 ref	1 ref
Rural	9	28	8	1.83 (0.93, 3.54)	1.67 (0.90, 3.12)	0.07
Do you have children						
Yes	50	94	32	1 ref	1 ref	1 ref
No	46	91	11	0.69 (0.45,1.05)	0.37 (0.14, 0.98)	0.04
Number of children						
No child	46	91	11	1 ref	1 ref	1 ref
One	28	47	13	1.18 (0.70,1.98)	0.44 (0.16,1.21)	0.11
Two -three	19	36	14	1.61 (0.91,2.83)	0.65 (0.23,1.82)	0.41
>three	3	11	5	2.85 (1.10,7.38)	2.05 (0.91,5.14)	0.06
Occupation						
Indoor worker	55	88	21	1 ref	1 ref	1 ref
Outdoor worker	41	97	22	1.33 (0.87,2.05)	1.77 (1.06,2.95)	0.03
Alcoholic						
Non alcoholic	60	134	32	1 ref	1 ref	1 ref
Previously alcoholic	10	13	1	0.47 (0.21,1.06)	0.43 (0.19,0.99)	0.04
Currently alcoholic	26	38	10	0.74 (0.04,1.24)	0.68 (0.39,1.19)	0.17
Work satisfaction						
Not satisfied	2	7	3	1 ref	1 ref	1 ref
Fairly satisfied	12	24	7	0.53 (0.15,1.89)	0.44 (0.12,1.64)	0.22
Satisfied	82	154	33	0.44 (0.14,1.38)	0.45 (0.14,1.49)	0.19
Work hours per week						
0–20 h	36	81	21	1 ref	1 ref	
21–40 h	32	49	9	−0.45 (−0.97,0.6)	0.61 (0.36,1.04)	0.07
>40 h	28	55	13	−0.15 (−0.66–0.36)	0.66 (0.33,1.13)	0.12

activity limitation among pregnant women with PGP with a history of drunk alcohol were decreased by 57% compared to pregnant women whom never drank alcohol. The result of this study supported by the finding of a systematic review study [33] and prospective cohort article [34]. In terms of functional activity, those who drink alcohol differ significantly from people who do not drink alcohol, and worries remain that the lower activity limitation associated with moderate drinking may be owing solely to the favorable risk factor profile seen in moderate drinkers.

4.1. Strength and limitation of the study

This is the first research of its kind in both the study area and the country. To assess activity limitation with a representative sample size, we employed a validated tool, the PGQ, which demonstrated excellent inter- and intra-observer reliability. Some notable limitations are addressed for the benefit of future research. Because there is a scarcity of literature in this field, and no earlier studies on its responsiveness have been published, comparisons in the discussion section are problematic.

5. Conclusion

In conclusion, this study revealed, nearly one-third of the study participants were reported low level of activity limitation while more than half pregnant women with PPGP had moderate to high level of activity limitation. Having previous children, occupation and taking alcohol were the independent predictors of pregnant women for activity limitation.

Declarations

Ethical approval and consent to participate.

This research was conducted in line with the Helsinki Declaration. The University of Gondar's School of Medicine, Department of Physiotherapy research and ethical review committee approved this study (Phys/056/07/2019). The signed agreement was obtained after delivering a verbal account and describing the study to the participants with pregnant women. Furthermore, all data collectors and investigators who

were strictly directed ensured the privacy and confidentiality of information.

Consent for publication

Consent for publication is not relevant.

Data sharing statement and availability

The study contains all of the study data related to these findings. Requests for more information on the dataset and questions about data sharing should be directed to the corresponding author via mogegashaw1@gmail.com.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Sources of funding

This study was partially funded by the University of Gondar. University of Gondar did not involve in the design of the study, data collection, analysis, and interpretation.

Ethical approval

Ethical clearance was secured from the ethical review committee of the department of Physiotherapy, University of Gondar, Ethiopia.

Consent

Personal identifiers in the manuscript and during data collection processes were not included. So, consent for publication not applicable.

Author contribution

MG, BJ and AZ developed the proposal, organized data collection, analyzed the data, prepared and revised the manuscript. AK, MM, FM,

ME, DG, NT, and MH involved in data collection, data analysis, and revised the manuscript. All authors approved the final manuscript for submission.

Registration of research studies

The research is registered in Research registry UIN 7756.

Guarantor

Moges Gashaw, Melisew Mekie, Alemu Kassaw, Balamurgan, Fantu Mammo Aragaw, Ashenafi Zemed, Mastewal Endalew, Nuhamin Tesfa Tsega, Melaku Hunie Asratie, and Daniel Gashaneh Belay are guaranteed for this work.

Declaration of competing interest

The authors report no conflicts of disclosure in this work.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.103754>.

Abbreviations

ANC	antenatal care follow-up;
AOR	Adjusted Odds Ratio
BP	Back Pain
COR	Cruds Odds Ratio
LBP	Low Back Pain
LMICs	Low-middle income countries
MoH	Ministry of Health
PGQ	Pelvic Girdle Pain Questionnaire;
PGP	Pelvic Girdle Pain
PPGP	Pregnancy-related Pelvic Girdle Pain
SD	Standard Deviation
UoGCSH	University of Gondar Specialized Hospital

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