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Low back pain and associated factors among obstetrics care providers in public hospitals of Amhara Regional State, Ethiopia: a cross-sectional study

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ABSTRACT

Objectives Although the study of low back pain (LBP) among healthcare workers in Ethiopia is becoming common, it mainly focused on nurses leaving obstetrics care providers aside. The objective of this study was to assess the prevalence and associated factors of LBP among obstetrics care providers in public hospitals in Amhara Regional State, Ethiopia.

Design An institution-based cross-sectional study.

Settings The study settings were nine public hospitals in Amhara Region.

Participants Randomly selected 416 obstetrics care providers working in public hospitals in Amhara Region, Ethiopia.

Outcomes The outcomes of this study were the prevalence of LBP in the last 12 months among obstetrics care providers and its associated factors.

Results Overall, the prevalence of LBP was 65.6% (95% CI 61.5% to 70.2%) among obstetrics care providers in the last 12 months.

Female gender (AOR 2.33, 95% CI 1.344 to 4.038), not having regular physical exercise habits (AOR 8.26, 95% CI 4.36 to 15.66), job stress (AOR 2.21, 95% CI 1.24 to 3.92), standing longer while doing procedures (AOR 2.04, 95% CI 1.14 to 3.66) and working more than 40 hours a week (AOR 2.20, 95% CI 1.09 to 4.45) were significantly associated with LBP.

Conclusion About two-thirds of obstetrics care providers working in public hospitals in the Amhara region reported LBP. The prevalence of LBP was higher among those who did not have regular physical exercise habits, had job stress, stood longer than 1 hour while doing procedures, worked more than 40 hours a week and female obstetrics care providers. Providing resting periods, decreasing the working hours of obstetrics care providers in a week, and counselling on the importance of doing regular physical exercise help to reduce the prevalence of LBP.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ To our knowledge, this is the first study on obstetrics care providers in Ethiopia
⇒ The study is a multicenter study.
⇒ The information on the experience of LBP for the last 12 months is highly dependent on the participants' memory, as a result, there might be under or over-estimation due to recall bias.

INTRODUCTION

Currently, musculoskeletal disorders (MSDs) have become one of the main issues for healthcare workers. They are the second most cause of physical disability worldwide.[1 2] Among MSDs, low back pain (LBP) is the most disabling cause and is widespread in the workplace.[1]

LBP refers to pain or discomfort in the spinal area localised between the 12th rib and the inferior gluteal folds with or without radiation to the lower extremities.[3] It is categorised as mild, moderate and severe based on Visual Analogue Scale measurements ranging from 0 to 10 and experienced as aching, stabbing, sharp or dull, specified.[3]

Given the rapid transition to the industrialised world, LBP inflicts a significant economic burden on healthcare resources, lost working days, loss of productivity and increased disability.[4 5] LBP causes 10.7% of total years lost due to disability.[6] And work-related LBP causes 818 000 disability-adjusted life-years lost annually in the world.[7] In addition, LBP results abstain from work, functional limitation and shortage of staff among obstetrics care providers. A study of Australian midwives reported that an annual sick leave prevalence rate of 24% and functional incapacity (unable to continue working activities) were 59% due to LBP.[8]

The overall prevalence of LBP was 24% among populations and 58% among healthcare workers worldwide.[9] Globally, LBP is the most prevalent MSD that affects 70%–85% of the adult population at some point in their lifetime.[10] In the low-income and middle-income countries, 80% of the population

experienced LBP during some period during their lifetime.[11] MSDs are a significant health problem at work among obstetrics care providers. Among 729 midwives with MSDs in Australia, 61% had LBP.[8] In the UK, the prevalence of LBP among midwives was 70%.[12]

Obstetrics care providers give care to women during pregnancy, childbirth and after birth.[13] Obstetrics care providers also transfer women frequently and keep sustained periods of stooping. They work in an awkward posture, bending and trunk flexion while giving care during labour.[14] Due to those extreme postures or positions and heavy workload during the childbirth process, obstetrics care providers are subject to physical constraints leading to LBP.[14 15]

Work-related factors (pulling, pushing and working in extreme positions to handle patients: women and baby at the same time), psychological factors (job stress) and organisational factors (lack of improved equipment support) were predictors of LBP among obstetrics care providers.[14 16 17]

To date, all studies in Ethiopia[17–20] and several studies around the globe[21] about LBP on healthcare workers focus mainly on nurses, while others on physicians.[22 23] Given the variations in practice and environment within healthcare professionals,[24] such studies failed to include the perspectives of obstetrics care providers. The objective of this study was to assess the prevalence and associated factors of LBP among obstetrics care providers in public hospitals in Amhara Regional State, Ethiopia.

METHODS

Study design and settings

An institution-based cross-sectional study was conducted from 2 January 2021 to 15 February 2021. The study settings were nine public hospitals of Amhara Regional State, Ethiopia: Debre Birhan, Felegehiwot, TibebeGhion, Debre Markos, Gondar, Dessie, and Injibara, Debre Tabor, and Woldiya Hospitals. Amhara regional state is one of the ten regional states of Ethiopia. Its capital city is Bahir Dar, which is 551 km from the capital city of Ethiopia.

Participants

The source populations were obstetrics care providers working in public hospitals in the Amhara region. The study populations were obstetrics care providers available in selected public hospitals in the Amhara region during the study period. Obstetrics cares providers of the selected public hospitals, except those who were pregnant and given birth in the last 12 months, participated in the study.

Sample size and sampling technique

A single population proportion formula with the assumptions of a 95% of a CI, a 5% margin of error and a 50% proportion of LPB, was used to calculate the sample size. By adding a 10% non-response rate final sample size became 422. There were 815 obstetrics care providers in sleeted hospitals. The individual samples were allocated proportionally to each hospital. Lists of obstetrics care providers were obtained from the human resource department of each hospital and used as a sampling frame. Then, individual samples were selected using a computer-assisted random generator.

Data collection tool and procedure

A structured pretested questionnaire was used containing six thematic categories designed to establish LBP prevalence, sociodemographic characteristics, organisational factors, work-related factors, Visual Analogue Scale, and personal and psychosocial factors. The Standardised Nordic Musculoskeletal Questionnaire[25] was used to assess the prevalence of LBP in the last 12 months. The other parts of questioner, such as sociodemographic characteristics, organisational factors, work-related factors, Visual Analogue Scale, and personal and psychosocial factors, were adapted from previous literature.[14 16–18 22]

The 12-month prevalence of LBP was dichotomised according to participants' specifications of the length of time they had experienced LBP. We classified it into 'yes,' if the participant experienced ache, pain or discomfort in the low back for at least 1 day (≥1 day) and 'no' if the participant never (0 days) suffered from LBP. The intensity of LBP was rated using a 10-point Visual Analogue Scale.[26] Visual Aanalogue Scale scores of 1–3 indicate mild LBP, 4–6 moderate LBP and 7–10 severe LBP in accordance with the previous study.[18]

Data were collected through a self-administered technique by giving the questionnaires to the study participants to fill and return on the next day. The training was given to data collectors and supervisors on study tools and data collection approaches. Filled questionnaires were checked for consistencies and completeness, and corrections were made accordingly.

Data measurement and study variables

The dependent variable is LBP—defined as any pain felt in the low back region for at least 1 day in the last twelve months following previous studies.[18 27]

Mild LBP—pain intensity on Visual Analogue Scale scores 1–3.[18]

Moderate LBP—pain intensity on visual analogue scale scores 4–6.[18]

Severe LBP—pain intensity on Visual Analogue Scale scores 7–10.[18]

The independent variables were (1) sociodemographic characteristics such as age, gender, marital status and educational status (2) personal and psychosocial characteristics such as working hours per week, body mass index, a pattern of sleep per day, job stress, alcohol drinking habit, regular physical exercise and work experience (3) organisational and work-related characteristics such as bending/twisting while working, standing >1 hour during a procedure, lifting manually heavyweight >10 kg, patient transfer, working while physically fatigue, availability of the assistive device and back-care training.

Job stress

The workplace stress scale[28] was used to assess participants' self-assessment on their feelings about their current work. To obtain a description of job stress participants were asked eight questions to indicate how often they had felt in their current job. Their responses were rated on a five-point scale, from 1 to 5: 1=never, 2=rarely, 3=sometimes, 4=often and 5=very often.[28] The result scores for the workplace stress scale range between 5 and 40 points. Individuals with a workplace stress scale score above the mean (≥21) were classified as having Job stress per a previous study.[29]

Data management and analysis

Data entry was done using EpiData V.3.1 and exported to SPSS V.25 for analysis. Frequency tables and mean were used to describe the characteristics of the study participants for categorical and continuous variables, respectively. Bivariate analysis, crude OR with 95% CI, was used to see the association between each independent variable and LBP. Independent variables that yield p≤0.25 during bivariate analysis were included in the multivariable analysis. The strength of association was measured using an adjusted OR with a 95% CI. Model goodness of fitness was verified using the Hosmer-Lemeshow statistic (0.475). Ap<0.05 was a cut-off point to declare a significant statistical association.

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Sociodemographic characteristics

A total of 416 obstetrics care providers completed the questionnaire with a response rate of 98.6%. The mean age ±SD of participants was 30.04±3.61 years. In terms of gender, 230 (55.3%) of participants were females. In terms of marital status, 238 (57.2%) participants were married, and 12 (2.9%) were divorced (table 1).

Table 1 Sociodemographic characteristics of obstetrics care providers working in public hospitals of Amhara Regional State, Ethiopia, 2021(n=416)

Variable	Category	Frequency	Per cent
Age	20–29	11	2.6
	30–39	368	88.5
	≥40	37	8.9
Gender	Female	230	55.3
	Male	186	44.7
Marital status	Married	238	57.2
	Divorced	12	2.9
	Single	166	39.9
Educational status	Diploma	55	13.2
	Degree	303	72.9
	Masters and above	58	13.9

Personal and psychosocial characteristics

Overall, 59.1% of obstetrics care providers worked more than 40 hours a week, and 68.8% slept less than 8 hours per day. Of the study participants, 170 (40.7%) do have a habit of alcohol drinking. One hundred and fifty-six (37.5%) participants had job stress, and 21 (5%) had a body mass index of 25 kg/m^2 or above. Among 416 participants, one-half (50.7%) of obstetrics care providers did have regular physical exercise habits at least three times per week for 30 min (table 2).

Organisational and work-related characteristics

The majority, 83% of participants, bent or twisted while working in their unit, whereas 70.2% stood longer than 1 hour while performing obstetrics procedures. Three-forth (75.7%) of study participants lifted heavyweight greater than 10 kg, and 72.6% of participants transferred patients frequently (table 3).

Prevalence of LBP and related characteristics

A total of 273 (65.6%; 95% CI 61.5% to 70.2%) obstetrics care providers reported that they experienced LBP in the last 12 months. Of those with LBP, 177 (64.8%) were females. More than half, 163 (59.7%) of participants who experienced LBP reported that they experienced moderate pain intensity and 74 (27.1%) experienced severe pain. Of these with LBP, 171 (62.6%) of participants' pain occurred every three to 5 days a week. Sixty-nine (25.3%) obstetrics care providers reported they experienced LBP radiating to their extremities (table 4).

Factors associated with LBP

Explanatory variables included in the adjusted analysis were age, gender, regular physical exercise habit, job stress, standing longer than 1 hour, working hours per week, body mass index, patient transfer, working while physically fatigued, availability of the assistive device and back-care training. Of those variables, female gender, not having regular physical exercise habits, job stress, standing longer than 1 hour during procedures, and working more than 40 hours a week were significantly associated with LBP. Female obstetrics care providers were 2.33 (AOR 2.33, 95% CI 1.344 to 4.038) times more likely to have LBP than males. Not having regular physical exercise habits were 8.26 (AOR 8.26, 95% CI 4.36 to 15.66) times more likely to have LBP. The odds of experiencing LBP were higher (AOR 2.21, 95% CI 1.24 to 3.92) among obstetrics care providers who had job stress. The odds of LBP were also higher (AOR 2.04 95% CI 1.14 to 3.66) among obstetrics care providers who stand longer than 1 hour while doing procedures. In addition, obstetrics care providers who work greater than 40 hours per week were 2.20 (AOR 2.20, 95% CI 1.09 to 4.45) more likely to have LBP than their counterparts (table 5).

Table 2 Personal and psychosocial characteristics of obstetrics care providers working in public hospitals of Amhara Regional State, Ethiopia, 2021(n=416)

Variable	Category	Frequency	Per cent
Working >40 hours/week	No	246	59.1
	Yes	170	40.9
Body mass index	<18.5	67	16.1
	18.5–24.9	328	78.8
	>25	21	5.0
The pattern of sleep per day	<8 hours	286	68.8
	≥8 hours	130	31.3
Job stress	No	260	62.5
	Yes	156	37.5
Alcohol drinking habit	No	246	59.1
	Yes	170	40.9
Regular physical exercise ≥3 days/week	No	205	49.3
	Yes	211	50.7
Work experience	<2 years	75	18.0
	2–5 years	219	52.6
	>=5 years	122	29.3

DISCUSSION

We assessed the prevalence and factors associated with LBP among obstetrics care providers working in public hospitals in the Amhara region. This study finding revealed that the prevalence of LBP was 65.6% (95% CI 61.5% to 70.2%) among obstetrics care providers in the last 12 months. Female gender, not having regular physical exercise habits, job stress, standing longer than 1 hour during procedures, and working more than 40 hours a week were significantly associated with LBP.

The prevalence of LBP in this study is comparable with study findings among nurses in western Ethiopia (63.6%)[29] and the UK (70%).[12] However, the prevalence of this study is higher than studies conducted among nurses in eastern Ethiopia (38.1%),[19] Addis Ababa, Ethiopia (45.8%)[18] and Malaysia 56.9%.[30] Obstetrics care providers work in an awkward posture, sustained periods of stooping and bending while caring for the women during labour. These subject them to physical constraints leading to LBP.[14 15] A previous study reported that working

Table 3 Organisational and work-related characteristics of obstetrics care providers working in public hospitals of Amhara Regional State, Ethiopia, 2021(n=416)

Variables	Category	Frequency	Per cent
Bending/twisting while working	Yes	353	84.9
	No	63	15.1
Standing >1 hour during the procedure	No	124	29.8
	Yes	292	70.2
Lifting manually heavyweight >10 kg	No	101	24.3
	Yes	315	75.7
Frequently transfer patients	No	114	27.4
	Yes	302	72.6
Working while physically fatigue	No	291	70.0
	Yes	125	30.0
Assistive device availability	No	228	54.8
	Yes	188	45.2
Back-care training	No	333	80.0
	Yes	83	20.0

Table 4 Low back pain experience among obstetrics care providers working in public hospitals of Amhara Regional State, Ethiopia, 2021

Variables	Category	Frequency	Per cent
LBP in the last 12 months (n=416)	Yes	273	65.6
	No	143	34.4
Pattern of radiation (n=273)	No radiation	204	74.7
	Radiate to extremities	69	25.3
Frequency of LBP (n=273)	Infrequent (less than 3 days per week	86	31.6
	Frequent 3–5 days per week)	171	62.6
	Daily pain	16	5.9
The intensity of the pain (n=273)	Mild	36	13.2
	Moderate	163	59.7
	Severe	74	27.1

in an awkward posture increases the prevalence of LBP.[19] The finding of this study is lower than study findings in Egypt (79%)[31] and Nigeria (73%).[32] The differences might be due to the difference in pain reporting culture between the study participants, the small sample size in those studies and lifestyle changes over time.

The prevalence of LBP in this study was higher among females than males. This finding is in line with studies in eastern Ethiopia (65%)[19] and Nigerian and Ethiopian hospitals (65.7%).[33] The variation could be physiological differences such as menstruation and pregnancy.[34 35] The variation could also be anatomical differences between males and females and hormonal effects.

In this study, obstetrics care providers who reported regular physical exercise habits were 8.26 times more likely to experience LBP than their counterparts. This finding is consistent with the research done among nurses in Ethiopia and Turkey.[27 36] Regular physical exercise habit improves the physical fitness of individuals and prevents easy fatigability of back muscles, thereby reducing the odds of LBP. Regular physical exercise also helps to normalise body mass index. El-Soud *et al* have shown that a body mass index greater than or equal to 25 kg/m^2 was a risk for LBP.

Working more than 40 hours a week was associated with the experience of LBP (p=0.029). This finding is consistent with a study in the UK.[24] Working longer hours a week was associated with the risk of obesity because of irregular eating patterns,[37 38] thereby increasing the odds of LBP. However, another study in western Ethiopia

Table 5 Factors associated with LBP among obstetrics care providers working in public hospitals in Amhara Regional State, Ethiopia 2021 (n=416)

Variable	Categories	LBP		95% CI	
		Yes	No	COR	AOR
Gender	Female	117	53	3.131 (2.056 to 4.768)	**2.33 (1.34 to 4.04)***
	Male	96	90	1.0	1.0
Regular exercise	No	184	21	12.011 (7.086 to 20.358)	**8.26 (4.36 to 15.66)†**
	Yes	89	122	1.0	1.0
Job stress	Yes	118	38	2.104 (1.353 to 3.271)	**2.21 (1.24 to 3.92)‡**
	No	155	105	1.0	1.0
Standing >1 hour during the procedure	Yes	202	90	1.675 (1.086 to 2.586)	**2.04 (1.14 to 3.66)§**
	No	71	53	1.0	1.0
Working >40 hours/week	Yes	201	47	5.702 (3.670 to 8.860)	**2.20 (1.09 to 4.45)¶**
	No	72	96	1.0	1.0

Bold, significant statistical association
*P=0.003
†P<0.001
‡P=0.007
§P=0.016
¶P<0.029
AOR, adjusted OR; COR, crude OR; LBP, low back pain.

showed no significant association between working hours and LBP.[29]

The odds of LBP were 2.21 times more likely among obstetrics care providers who had job stress than their counterparts. This finding is consistent with study finding in Addis Ababa public hospital.[18] Stress increases muscle tension and physical fatigue. Fatigue negatively influences muscle receptors and finally on pain receptor area sensation, thereby increasing the odds of LBP. On the other hand, job stress was not significantly associated with LBP in a study in western Ethiopia.[29] Since the information on the experience of LBP for the last 12 months highly depends on the participants' memory, there might be under or overestimation due to recall bias.

CONCLUSION

Two-thirds of obstetrics care providers working in public hospitals in the Amhara region experienced LBP. Female gender, not having regular physical exercise habits, having job stress, standing longer while doing procedures, and working more than 40 hours a week were significantly associated with LBP. Providing rest periods, decreasing the working hours of obstetrics care providers in a week, and counselling on the importance of doing regular physical exercise helps to reduce the prevalence of LBP.

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Contributors BTZ: conceptualisation; data curation; formal analysis; investigation; resource; writing original draft. BCT: conceptualisation; formal analysis; investigation; methodology; writing-review and editing. MAE: conceptualisation; investigation; supervision; validation; writing-review and editing. YM: conceptualisation; formal analysis; investigation; resource; methodology; writing-review and editing. SGT: conceptualisation; investigation; supervision; resource; validation; writing original draft; writing-review and editing. All authors approved the final version of the manuscript. SGT is the guarantor of the study.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants and was approved by the Research Ethical Review Board of the College of Medicine and Health Sciences, Wolkite University in Ethiopia, (Ref no HSC/R/C/SE/PG/CO/412/2021) approved this study. We have submitted a support letter to each participating hospital and got permission. We also obtained Voluntary informed consent from each study participant. Data collection was anonymous to maintain the confidence of participants. Verbal informed consent was obtained from each study participant after explaining the purpose of the study. Participants gave informed consent to participate in the study before taking part.

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Data availability statement Data are available on reasonable request. The data set used or analysed during this study is available from the corresponding author on reasonable request.

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