Determinants of health care utilisation for low back pain: a population-based study in Ethiopia

Abstract

Low back pain (LBP) remains one of the major public health problems worldwide. However, in low-income countries, such as those in Africa, the epidemiological data on health care utilisation for LBP are lacking due to more pressing problems such as infectious diseases, to which the majority of health resources are channelled. Therefore, this study aimed at investigating determinants of health care utilisation for LBP in the general population of Ethiopia. A population based cross-sectional study was conducted in South-West Shewa zone of Ethiopia from June to November 2018. The data were collected by interviewing adults with LBP (n=1812, randomly selected) using a psychometrically tested and validated instrument, analysed using R version 3.5.1. A log-binomial regression model was used to determine the Prevalence Ratio (PR) with a 95% confidence interval (CI) in identifying factors associated with health care utilisation for LBP. Estimates of population parameters were also presented with 95% CIs and p-values. For all applications of inferential statistics, a p-value of ≤ 0.05 was taken as the significance level. The lifetime prevalence of health care utilisation for LBP was 36.1%, 95% CI: 33.9-38.1, while the annual prevalence rate was 30%, 95% CI: 27.9-32.2. Of those with a one-year history of health care utilisation, while 7.4%, 95% CI: 4.9-10.3 rural and 36.6%, 95% CI: 29.5-44 urban populations utilised health care from general hospitals, 1.4%, 95% CI: 0.3-2.7 rural and 6.8%, 95% CI: 3.1-10.8 urban populations utilised health care from specialised hospitals. Several socio-demographic factors, modifiable health behaviours/lifestyle habits, pain interrelated factors, and specific factors such as beliefs about the pain, depressive symptoms and insomnia were associated with health care utilisation for LBP. The implications of this research are that it may be prudent for the Ethiopian health care

policy makers to develop the necessary strategies to meet the health needs of both urban and rural populations with LBP.

Keywords: Low back pain; Health care utilisation; Determinants; Population-based; Cross-sectional study

What is known about this topic?

- LBP is a major public health problem, being highly prevalent and the leading cause of years lived with disability all over the world.
- Efforts to use primary prevention have only limited potential. Early diagnosis and treatment may help to minimise the long-term negative impact of LBP including excessive costs and poor health outcomes.

What this paper adds?

- While the majority of rural population contacted health centres, a significant number of the urban population contacted general hospitals to get the required health care for their pain. This variation in the point of health care contact demonstrates potential urban-rural disparities to access better health services.
- The most decisive factors explaining the variations in health care utilisation for LBP were identified.

Introduction

Low back pain (LBP) is one of the most prevalent public health problems globally (Bart et al., 2010; Hoy et al., 2010; Hoy et al., 2012). According to (Hoy et al., 2012), the global point, one-month and annual prevalence of LBP are 11.9%, 23.2% and 38%, respectively. LBP affects individuals of all age groups (Hartvigsen et al., 2018; Major-Helsloot et al., 2014), and is the leading reason for reduced activity levels, premature disability and early retirement, resulting in a significant loss of productivity at work (Gore et al., 2012). The contribution of LBP to economic crises for employers through decreased productivity and increased costs of unworked days, and the payment of health insurance and disability compensation is also substantial (Wynne-Jones et al., 2008). The literature further demonstrates that LBP is one of the main reasons for health care provider consultation, hospitalisation, surgical procedure, implantation service, and medication, and is associated with a considerable economic and social consequences (Wynne-Jones et al., 2008; Deyo et al., 2009). This also has far reaching implications in terms of the billions of dollars incurred in medical expenditure every year globally (Wieser et al., 2011; Maher et al., 2017).

When measured as years of productive life lost due to disability (YLDs), LBP is the leading contributor to global burden of disease while it ranks sixth when measured as disability adjusted life years (DALYs) (Vos et al., 2013; Hoy et al., 2014; Murray et al., 2012). Moreover, evidence demonstrates that both the prevalence and DALYs caused by LBP increase over time (Hoy et al., 2014). For example, from 2005 to 2015, the global prevalence of chronic LBP has increased by 17.3% (Hurwitz et al., 2018). Similarly, DALYs caused by LBP alone increased from 58.2 million in 1990 to 83 million in 2010 (Hoy et al., 2014).

Several risk factors including personal and environmental factors were also documented to influence both the onset and the natural course of LBP (Hoy et al., 2010). In particular, lower

educational status, being female, lower wealth, daily computer use for more than two hours, smoking, stress, anxiety, depression, comorbidity, job dissatisfaction, and lack of social support at workplace were documented as factors associated with a higher prevalence of LBP (Hoy et al., 2010; Dunn et al., 2013; Williams et al., 2015; Maher et al., 2017). Moreover, the risk of experiencing LBP is argued to develop at an early age due to unhealthy behaviours including obesity and weight gain in early childhood, which have also been shown to have a strong association with the later occurrence of LBP (Janke et al., 2007). Thus, given that the causation of LBP is multifactorial, the application of primary prevention has only limited potential (Balagué et al., 2012). Alternatively, appropriate and timely care seeking for LBP in its early phase can minimise the long-term negative impact of pain (Traeger et al., 2015; Froud et al., 2014). However, a comprehensive review of the literature showed that little is known about health care utilisation for LBP and its determinant factors (Beyera et al., 2019a). The same authors argued that because the little available evidence is skewed to high-income countries, there is a lack of data about health care utilisation for BP in low- and middle-income countries. Moreover, due to more pressing problems such as HIV/AIDS and other infectious diseases, the limited health resources in Africa are channelled there, rather than musculoskeletal disorders such as LBP (Hoy et al., 2012; Morris et al., 2018). Therefore, the aim of this study was to investigate determinants of health care utilisation for LBP in the general population of Ethiopia.

Methods

Study design and setting

A population based cross-sectional study was conducted in June-November 2018 in South-West Shewa zone of Oromia Regional State, Ethiopia. The zone is located in central Ethiopia. This zone has an estimated 1,341,702 population, 50.3% males and 49.7% females, 2 general

hospitals, 3 primary hospitals, 54 health centres, 83 private clinics, 242 health posts, and 24 drug stores. The nearest specialised hospital is in Addis Ababa, the capital of the country.

Study sample and sampling procedure

The sample size for the study was calculated using a single population proportion formula. The expected prevalence of health care utilisation for LBP (P=50%) was considered due to the absence of a previous study. With 95% level of confidence, 4% margin of error, 3 design effect, and 10% non-response, 1981 adults with LBP were estimated to be included in the study.

A multistage sampling technique was used to select the study participants. After the districts were stratified into urban and rural settings, three districts (one urban and two rural districts) were selected as used by Cohen et al. (2007). From each of the three selected districts, two kebeles (wards) were then drawn randomly using the OpenEpi Random number generator (Dean et al., 2013), giving a total of six kebeles in the study. The households within the selected kebeles were then identified proportionately using a systematic random sampling method. That is, to ensure representativeness of the sample population, the number of households selected from each kebele was determined based on the total number of households found in each kebele.

Inclusion criteria

All adults (≥18 years) with LBP and living in private houses were included in the study.

Exclusion criteria

Individuals with LBP who could not represent the general population (for example, institutionalised persons) and individuals who could not give their responses were excluded.

Data collection instrument and procedure

The data were collected using an instrument that was developed and validated for this study. The overall psychometric properties of the instrument were shown to be good. The development and validation of the instrument are described in detail elsewhere (Beyera et al., 2019b). The data were collected by graduates with a first degree in health and/or related field (n=12) through interview technique using the Oromo language version of the instrument. In identifying cases with LBP, the individuals were directed to a picture of a person with a shaded area defining the low back region and were asked whether they had pain lasting more than one day in that region. Individuals were defined as having LBP and invited to be included in the study if they reported that they had pain in the specified body region. In each of the selected households, only one adult with LBP was interviewed. Whenever more than one eligible respondent was found in the selected household, only one respondent was chosen by lottery method. With this method, each of the individuals with LBP was assigned a unique number, which was placed in a bowl and one number was drawn at random. When there was no eligible respondent in the selected household, the next household was visited.

Data quality management

To maintain the quality of the data, training was given to the data collectors using a pre-developed training manual before data collection. Completed questionnaires were checked for missing data and immediate action was taken in cases where there were missed questions and/or other errors. To minimise errors during data entry, a data entry template was programmed using check codes in Epi-Info version 7.0. After the data entry was completed, accuracy was checked against the raw data and the necessary corrections were made before the analyses.

Operational definitions

In this study, LBP was defined as pain localised below the line of the 12th rib and above the inferior gluteal folds lasting more than one day (Hoy et al., 2012). LBP is often classified as acute (lasts < 4 weeks), subacute (lasts 4-12 weeks) and chronic (lasts > 12 weeks) (Furlan et al., 2009; Ramond-Roquin et al., 2015). In addition, health care utilisation was conceptualised as a consultation, or a series of consultations for LBP (de Vet et al., 2002). Pain intensity was measured on an 10-point Numerical Rating Scale (NRS) and defined as mild, moderate and severe pain for ratings of 1-3, 4-6 and 7-10 (Jones et al., 2007), respectively. Beliefs about LBP were measured with a five item Likert-scale, with responses ranging from strongly agree to strongly disagree. Optimistic individuals with a score above the mean were classified as having positive beliefs, while those who scored below the mean score were classified as having negative beliefs about the pain. Depressive symptoms were assessed with four-items as recommended by (Deyo et al., 2014), with four response options (never=0, seldom=1 sometimes=2, several times=3), totalling a maximum of 12-points. Individuals who scored 0-4, 5-6, and 7-12 points were defined as normal, borderline cases, and cases, respectively. Insomnia was assessed with four items 'difficulty falling asleep at night', 'waking up too early and not getting back to sleep', 'waking up repeatedly during the night' and 'sleepiness during the day' in the preceding year, each with four response options: never, seldom, sometimes and several times. As in the literature (Sivertsen et al., 2012), those who answered "sometimes" or "several times" to the last item, and to at least one of the first three items, were classified as having insomnia.

Statistical analyses

The data were analysed using R version 3.5.1. In a cross-sectional study with a rare outcome, the odds ratio obtained from logistic regression model is a good estimate of the risk ratio (Bastos et al., 2015). However, when logistic regression is modelled for common events, the estimated odds ratio is not close to the risk ratio and will be further from the null. This shows

that logistic regression model improperly overestimates the prevalence odds ratio of common events and may be misleading (Bastos et al., 2015). One of the options to avoid the inflation of the association that the logistic regression model may yield, and to obtain an unbiased estimate of association, is to model the data using log-binomial regression (Coutinho et al., 2008; McNutt et al., 2003). Therefore, given that a cross-sectional study design was used in this study and health care utilisation in people with LBP is not a rare event, log-binomial regression model was used to compute the Prevalence Ratio (PR) with a 95% confidence interval (CI) in identifying factors associated with a one-year history of health care utilisation for LBP. Estimates of population parameters were also presented with 95% CIs and p-values. For all applications of inferential statistics, a p-value of ≤ 0.05 was taken as the significance level.

Ethical approval

Ethical approval for this study was obtained from the Human Research Ethics Committee (Tasmania) Network, ethics reference number H0017128. Approval for data collection was obtained from Oromia Regional State Health Bureau, South-West Shewa Zone Health Office, and Health Officials of the selected districts. Verbal informed consent was also obtained from all study participants. Participation in the study was voluntary and confidentiality maintained at all times.

Results

Socio-demographic characteristics of the study participants

Of the total 1981 selected adults with LBP, 1812 participated in the study, forming a response rate of 91.5%. More than half (54.3%) of the participants were rural inhabitants and 828 (45.7%) were females. Participants' ages ranged from 18 to 97 years with a median (interquartile range [IQR]) 38 (30-50) years (Table 1).

Health care utilisation characteristics of people with LBP

The lifetime prevalence of health care utilisation for LBP was 36.1%, 95% CI: 33.9-38.1 while the annual prevalence rate was 30%, 95% CI: 27.9-32.2 (Table 2). Of those who reported a one-year history of health care utilisation, 206 (37.4%), 203 (37.4%), 102 (18.8%) and 32 (6%) utilised the care once, twice, three times and more than three times, respectively. The most common type of health facilities that provided health care services for people with LBP were health centres (47.7%) (Figure 1). The majority (64.8%) of the rural residents utilised health care from health centres while most (36.6%) of the urban residents utilised health care from general hospitals to optimise their pain (Figure 2). Injection of medications (77.2%) was found to be the most common treatment (Figure 3).

The majority 875 (69%) of the participants without a lifetime history of health care utilisation for LBP could not justify the cost. The remaining 202 (15.9%) and 192 (15.1%), respectively, specified that the facility was too far away and other reasons including that the pain was inconsequential and did not require treatment. Utilisation of alternative medicines such as massage by traditional healers, holy water and cupping was reported by 145 (8%), 31 (1.7%) and 67 (3.7%) of the participants, respectively.

Socio-demographic factors and lifestyle habits influencing health care utilisation for LBP

Using log-binomial regression analysis, several socio-demographic factors and lifestyle habits affecting health care utilisation for LBP were identified. A statistically significant association was observed between participants' age and health care utilisation. The adjusted prevalence ratio of health care utilisation increased as age group increased from 18-29 years (30-39 years, APR=1.54, 95% CI: 1.22-1.97; 40-49 years, APR=1.80, 95% CI: 1.41-2.32; $\geq$50 years, APR=2.42, 95% CI: 1.93-3.07). The test for trend ($p<0.001$) also verified that the association between age and health care utilisation for LBP was dose-dependent. When adjusted for educational status and age, the association of participants' gender with health care utilisation

was not statistically significant (female, APR=0.92, 95% CI: 0.79-1.06). In contrast, a statistically significant association was observed between educational level and health care utilisation. Compared with participants who never attended formal education, participants who attended elementary school (APR=1.40, 95% CI: 1.14-1.75), secondary school (APR=1.50, 95 CI: 1.17-1.92) and who graduated first degree or above (APR=1.68, 95% CI: 1.31-2.16) reported higher prevalence of health care utilisation. The prevalence ratio of health care utilisation was significantly higher in the rural (APR=1.69, 95% CI: 1.44-1.99) than the urban residents. In terms of marital status, only those married participants (APR=1.43, 95% CI: 1.10-1.90) showed a statistically significant association with health care utilisation for LBP when compared with never married participants. Participants living alone were 26% less likely to utilise health care for their LBP (APR=0.74, 95%, CI: 0.54-0.97) than those living with their nuclear families.

Lifestyle habits including smoking, alcohol consumption and khat (a plant with leaves and stem tips which are chewed for their stimulating effect) chewing were fitted together into the log-binomial model to control for possible effects of confounders. The results showed that the prevalence of health care utilisation was 26% lower in former smokers than current smokers (APR=0.74, 95% CI: 0.55-0.99). Likewise, former alcohol consumers were 32% less likely to utilise health care than current alcohol consumers (APR=0.68, 95% CI: 0.59-0.78). However, there was no statistically significant association between khat chewing and health care utilisation (Table 3).

Beliefs about the pain, pain and general health related factors influencing health care utilisation for LBP

When adjusted for pain duration and pain intensity, individuals with negative beliefs about LBP were 1.72 times more likely to use health care for their pain (APR=1.72, 95% CI: 1.48-

2.00). In the unadjusted log-binomial regression model, participants with longer pain duration were more likely to use health care. However, when adjusted for pain interference with daily activities, pain intensity and whether the pain spread down the leg(s), the association of pain duration with health care utilisation was not statistically significant. There was also no statistically significant association between pain interference with social activities and health care utilisation for the pain. The prevalence of health care utilisation was higher in individuals whose pain spread down their legs (APR=1.26, 95% CI: 1.04-1.51). Compared to those whose pain did not interfere with their daily activities at all, participants whose pain interfered with their daily activities reported a higher prevalence of health care utilisation. However, the association was dose-independent (pain interfere with daily activities: a little bit, APR=3.00, 95%, CI: 1.70-4.90; somewhat, APR=4.53, 95% CI: 2.62-7.22; quite a bit, APR=3.82, 95% CI: 2.20-6.09; very much, APR=4.86, 95% CI: 2.53-8.65). Pain intensity was also associated with health care utilisation. The prevalence ratio of health care utilisation was higher in participants with moderate pain (APR=1.29, 95% CI: 1.10-1.51) and severe pain (APR=1.23, 95% CI: 1.03-1.45). In addition, days off work due to LBP (APR=3.71, 95% CI: 3.15-4.36) and comorbidity with additional spinal pain (APR=1.30, 95% CI:1.15-1.49) increased the prevalence of health care utilisation.

Current and past year general health status, which was not excellent, increased the use of health care ([past year health status]: very good, APR=1.50, 95% CI: 1.04-2.31; good, APR=3.31, 95% CI: 2.30-5.03; fair, APR=2.89, 95% CI: 1.90-4.56, poor, APR=3.25, 95% CI: 2.00-5.31; [current health status]: very good, APR=1.94, 95% CI: 1.41-2.77; good, APR=2.42, 95% CI: 1.76-3.45; fair, APR=1.27, 95% CI: 0.85-1.93; poor, APR=2.03, 95 CI: 1.24-3.26). While participants at the borderline of depressive symptoms were 21% less likely to use health care (APR=0.79, 95% CI: 0.66-0.93) than those with no depressive symptoms, participants with

insomnia were 1.34 times more likely to use health care than those with no insomnia (APR=1.34, 95% CI: 1.15-1.54) (Table 4).

Discussion

This study investigated determinants of health care utilisation for LBP in Ethiopia. Accordingly, several factors influencing health care utilisation for LBP were identified. These included socio-demographic factors such as age, educational level, marital status, residential area, living conditions, and other behavioural and clinical factors including beliefs about the pain, smoking, alcohol consumption, pain intensity, past year and present general health status, comorbidity with additional spinal pain, insomnia, depressive symptoms, days off work due to the pain, and pain interference with daily activities.

In this study, 30% of individuals with LBP utilised health care in the past year, while 36.1% utilised health care at least once in the course of their lives. These findings are lower than those in a systematic review of the literature in high-income countries, which showed that the pooled annual prevalence rate of health care utilisation in LBP population was 51% (Beyera et al., 2019a). A prospective follow-up study conducted in Norway also showed that 43% of people with new onset of neck and/or LBP used conventional health care at least once over the course of a year (Woodhouse et al., 2016). The mismatch between the findings of the present study and other studies can be attributed to the following four reasons. Firstly, there is a fundamental difference between high- and low-income countries. Given the health care system, socioeconomic and cultural differences between high- and low-income countries, the experiences and consequences of LBP are not similar. For example, deep-rooted infectious diseases, extreme poverty, availability and accessibility of health care may affect differently the experiences of reporting health care utilisation for LBP in low-income countries (Williams et al., 2015). Secondly, the methodological approaches used in these studies were different.

Whilst this study was a cross-sectional study, the others were systematic review and prospective follow-up studies. Thirdly, the study in Norway combined LBP and neck pain whereas this study was only about LBP. Finally, health care utilisation may be defined differently between studies, which varies from consulting physicians alone to consulting any health care provider and complementary and alternative medicine providers (Côté et al., 2001).

This study showed that the majority (47.7%) of the participants utilised health care from health centres while only 3.3% utilised from specialised hospitals (tertiary health care levels). These findings reflect the nature of the Ethiopian health care environment, where the patients visit the lower levels of health care and receive different treatments including injection of medication, exercise, massage therapy and minor surgery for their LBP. Contemporary evidence also supports the management of LBP within the primary health care (PHC) level (Bart et al., 2010). For example, (Kopansky-Giles et al., 2018) argued that patients who received PHC level management for spinal pain have improved outcomes and cost savings. In the Ethiopian health care system, the PHC level includes health posts, health centres and primary hospitals (Figure 4), which provide health promotion, disease prevention and curative health services, and therefore, may offer an optimal platform for LBP management. A study supporting this concept notes that "PHC is people centred which creates the opportunity to build longstanding relationships between people and health care providers. The PHC approach is therefore well suited for persistent and costly conditions such as LBP" (Major-Helsloot et al., 2014, p. 698). However, there is evidence that PHC in Africa, including Ethiopia, remains under developed unlike that of other regions of the world (World Health Organization, 2008).

In this study, while the majority (64.8%) of rural population received health care from health centres (primary level health care), the majority (36.6%) of urban population received health care from general hospitals (secondary level health care). This difference in point of health care contact to get the required care for LBP may emphasise important issues regarding urban-rural

disparities to access better health services. As in other developing countries, in Ethiopia, access to health services is disproportionate. Whilst more than 80% of the Ethiopian population live in rural settings, general and specialised hospitals with relatively better services are concentrated in urban regions of the country. A similar problem was noted in the findings of a study undertaken in Ghana, which indicated that 60% physiotherapists in the country were found in large hospitals in urban areas (Oppong-Yeboah and May, 2014). Indeed, such issues are not only confined to low-income countries. For example, rural and remote area residents in Australia are often not able to access multidisciplinary pain management services, which are typically provided in tertiary health care settings in the cities (Traeger et al., 2019). According to Briggs et al. (2012), Kununurra (rural Western Australia) residents with chronic LBP would have to travel more than 800 km to Darwin or more than 3000 km to Perth to access the nearest centre providing multidisciplinary pain management services. In keeping with this idea, there is also other evidence to show that location of residence contributes to inequality of health care utilisation for health conditions (Zhu et al., 2017) including LBP (Bath et al., 2018). In addition, the socioeconomic difference between the urban and rural populations contributes greatly to the variation in point of health care utilisation (Olah et al., 2013; Plénet et al., 2010; Gebauer et al., 2017). This is because the costs of care increase with the level of the health care system. For example, Dutmer et al. (2019) found that health care costs for LBP patients seeking care from secondary and tertiary levels of care were twice as high compared to patients seeking care from primary level of care.

This study showed that injection of medications was the most common treatment received by LBP patients. This may reflect a lack of attention among health care providers to existing clinical guidelines (Oppong-Yeboah and May, 2014). The most current clinical guidelines reflect that there is a clear movement away from medicalised to non-medicalised management of LBP (Chenot et al., 2017; Qaseem et al., 2017; Stochkendahl et al., 2018). In principle,

health care providers following these guidelines need to manage uncomplicated cases of LBP with advice, education and reassurance. Alternatively, patients at risk of transition to the chronic phase of the pain, and developing disability, should be managed with interventions such as spinal manipulation, acupuncture, massage, yoga, mindfulness, psychological therapies or multidisciplinary rehabilitation (Traeger et al., 2019). It should be noted, however, that most health care systems, particularly those in low-income countries, like Ethiopia, are not well-equipped to support this approach. This may reflect the importance of system-wide reform to deliver appropriate and guideline-concordant care for patients with LBP (Traeger et al., 2019).

Log-binomial regression analysis demonstrated that several socio-demographic factors including age, educational level, residential area, marital status and living conditions influenced health care utilisation for LBP. The adjusted prevalence ratio of health care utilisation for LBP was significantly increased as age increased from 18-29 years, and the test for trend verified that there was a dose-dependent association between age and health care utilisation for LBP. Similar results were noted in other studies (Ono et al., 2015; Jöud et al., 2012). In particular, the authors of a study in Canada concluded that the trend to physician consultation for LBP increases in aging population, and in a recurrent pattern (Beaudet et al., 2013). Improved level of education also led to increased prevalence ratio of health care utilisation, which may be due to higher level of literacy being associated with better use of health care and better health outcomes (Berkman et al., 2011). Some studies showed that females were more likely to use health care than males (Ono et al., 2015; Ferreira et al., 2010; Mannion et al., 2013). However, in this study, the effect of participants' gender on health care utilisation was not significant when adjusted for age and educational level, suggesting that men and women are equally concerned about their health. Rural residents were 1.69 times more likely to utilise health care than urban residents while participants living alone were 26% less likely to utilise health care than those living with their nuclear families. Szpalski et al. (1995)

also showed that rural residents were more likely to utilise health care than metropolitan urban residents, which is supported by the finding of this study. However, one study in North Carolina showed that rural residents were less likely to receive rheumatology care than their urban counterparts (Goode et al., 2013).

Lifestyle habits including smoking and alcohol consumption status were associated with health care utilisation for LBP. The adjusted prevalence ratio of health care utilisation was 26% lower in former smokers than current smokers. In addition, former alcohol consumers were 32% less likely to utilise health care than current alcohol consumers. These findings are inconsistent with a previous study which showed that a greater proportion of health care users had never smoked nor consumed alcohol (Ono et al., 2015).

Health beliefs are values and attitudes that people have about health and the use of health care, which can be seen as the bridge between social structure and perceived need for health care (Andersen, 2008). Health beliefs are also about the status of an individual in the community or the individual's capacity to cope with presenting problems, which can influence the individual's perception about the need to seek and use health care. In keeping with this concept, in this study, individuals with a negative beliefs about LBP were more likely to use health care for their pain, indicating the importance of dealing with such inappropriate beliefs in fear avoidant individuals during the health care provision (Mannion et al., 2013). The recent Lancet LBP series (Buchbinder et al., 2018) called for interventions to deal with such widespread misconceptions. This is because individuals' LBP beliefs affect their pain perception, interpretation, pain-related behaviour and coping mechanisms and treatment response, all of which in turn impact the outcomes of LBP (Igwesi-Chidobe et al., 2018). For example, in a study by Guerra et al. (2017), LBP individuals with negative beliefs about the pain were found to have worse functional performance and activity limitations.

Factors such as pain spreading down the leg(s), pain interfering with daily activities, higher pain intensity, days off work due to LBP, comorbidity with additional spinal pain, unfavourable current and past year health status increased the prevalence ratio of health care utilisation for LBP. There is growing literature supporting these findings (Mannion et al., 2013; Woodhouse et al., 2016; Ono et al., 2015; Ferreira et al., 2010; Côté et al., 2001). For example, Mannion et al. (2013) indicated that worse general health, higher pain intensity and limitations in activities of daily living increased the odds of health care utilisation for LBP. Ono et al. (2015) further noted that there was a dose-response relationship between pain intensity and health care utilisation. However, the same authors (Ono et al., 2015) documented that there was no statistically significant association between comorbid conditions and health care utilisation, which is not in accordance with the finding of this study. It is also worth noting that many of the aforementioned factors were also shown to be strong predictors of poor health-related quality of life. For example, a community-based study among Swiss aged population (Ludwig et al., 2018) indicated that pain spreading down the leg(s) and/or knee(s), higher pain intensity and chronicity of the pain were strongly associated with a decreased health-related quality of life.

This study also identified that depressive symptoms and insomnia were associated with health care utilisation. While individuals at the borderline of depressive symptoms were 21% less likely to utilise health care than those with no depressive symptoms, individuals who had insomnia were 1.34 times more likely to utilise the care than those with no insomnia. The higher prevalence ratio of health care utilisation among people with insomnia could be linked with the notion that the pain causes sleep disturbances. For example, in an epidemiological study that characterised low back and leg pain patients seeking health care from primary care, more than two-thirds reported having pain related sleep disturbances (Konstantinou et al., 2015), which may drive the patients to seek care. Alternatively, the lower level of health care

utilisation in individuals at the border line of depressive symptoms does not support the findings of another study, which indicated that depressive symptoms increased the frequency of health care utilisation (Woodhouse et al., 2016). Mortimer and Ahlberg (2003) also argued that health care utilisation for LBP commonly coincides with high levels of psychological distress.

One of the strengths of this study is that the data were collected using an instrument developed and validated with the same population for the purpose of this study. In addition, the study maintained a high response rate (91.5%). Having a relatively large sample size, with one-third utilised health care, provided reasonable statistical power to demonstrate subtle associations with the explanatory variables. Nonetheless, this study has some limitations. Self-reported one-year history of health care utilisation data remain subject to under/over recall and reporting bias. It is also not possible to exclude the fact that some participants may incorrectly recall both health care utilisation due to LBP and other illnesses. The cross-sectional nature of the study also makes it impossible to disentangle a cause and effect association between the identified predicting factors and health care utilisation for LBP.

Conclusions

This study showed that the prevalence rate of health care utilisation to optimise the resulting burden of LBP was low in both the urban and rural populations of Ethiopia. The importance of socio-demographic factors, modifiable health behaviour/lifestyle habits, beliefs about LBP, pain interrelated characteristics, and psychological factors such as depressive symptoms and insomnia in explaining the variation in the prevalence rate of health care utilisation for optimal management of LBP was identified. The study also showed potential urban-rural disparities to access the middle and the top tiers of the health care system with relatively better services. The implications of this research are that it may be prudent for the Ethiopian health care policy

makers to develop the necessary strategies to meet the health needs of both urban and rural populations with LBP. A prospective cohort study is also needed to understand better the temporal nature of the relationships between the predicting factors and health care utilisation for LBP.

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Tables

Table 1. Socio-demographic characteristics of the study participants (n=1812)

Characteristics	Number	%
Sex		
Male	984	54.3
Female	828	45.7
Age (in years)§	38 (30-50)	-
Ethnicity		
Oromo	1371	75.7
Amhara	264	14.6
Gurage	162	8.9
Others!	15	0.8
Educational level		
No formal education	302	16.6
Elementary (grade 1-8)	650	35.9
Secondary (grade 9-12)	339	18.7
Technical/Vocational Certificate	123	6.8
Diploma	217	12.0
First degree or higher	181	10.0
Residence		
Urban	836	46.1
Rural	976	53.9
Marital status		
Single/never married	330	18.2
Married	1199	66.2
Cohabited¶	44	2.4
Separated	47	2.6
Divorced	73	4.0
Widowed	119	6.6
Living condition		
Living with family	1540	85.0
Living with nonfamily members	76	4.2
Living alone	196	10.8
Household family size§	4 (3-6)	-
Occupation		
Farmer	608	33.5
Merchant	397	21.9
Government employee	355	19.6
Student	195	10.8
NGO employee	101	5.6
Retired and not working	44	2.4
Others‡	112	6.2

!Kambata, Silte, Hadiya, Tigre; NGO: non-governmental organisation; §median (interquartile range); ¶couple not officially married but living together as a wife/husband; ‡daily labourer; running own business, casual job, micro and small enterprise

Table 2. Health care utilisation characteristics of people with LBP in Ethiopia (n=1812)

Kebele/ward	Ever used health care				Used health care in the past one-year				Total
	Yes		No		Yes		No		
	Number	%	Number	%	Number	%	Number	%	
Woliso-01	109	26.8	297	73.2	88	21.7	318	78.3	406
Woliso-02	130	30.2	300	69.8	103	24.0	327	76.0	430
Adami Wedessa	55	22.3	192	77.7	46	18.6	201	81.4	247
Gambella Goro	92	39.3	142	60.7	69	29.5	165	70.5	234
Sonkolle	114	42.5	154	57.5	100	37.3	168	62.7	268
Meti Walga	154	67.8	73	32.2	137	60.4	90	39.6	227
Total	654	36.1	1158	63.9	543	30.0	1269	70.0	1812

Table 3. Socio-demographic factors and lifestyle habits influencing health care utilisation for LBP

Factors	PR (95% CI)	p-value	APR (95% CI)	p-value
Sex (male†)				
Female	0.85 (.74-0.98)	0.031	0.92 (0.79-1.06)	0.223
Age, in years (18-29†)				
30-39	1.51 (1.19-1.92)	<0.001	1.54 (1.22-1.97)	<0.001
40-49	1.76 (1.39-2.26)	<0.001	1.80 (1.41-2.32)	<0.001
≥50	2.17 (1.75-2.73)	<0.001	2.42 (1.93-3.07)	<0.001
Educational level (No formal education†)				
Elementary (grade 1-8)	1.11 (0.90-1.38)	0.344	1.40 (1.14-1.75)	0.002
Secondary (grade 9-12)	1.04 (0.81-1.32)	0.776	1.50 (1.17-1.92)	0.002
Technical/Vocational certificate	0.89 (0.61-1.24)	0.498	1.30 (0.89-1.83)	0.152
Diploma	0.78 (0.57-1.05)	0.107	0.97 (0.71-1.32)	0.865
First degree or higher	1.42 (1.10-1.82)	0.007	1.68 (1.31-2.16)	<0.001
Residence (Urban†)				
Rural	1.58 (1.36-1.84)	<0.001	1.69 (1.44-1.99)	<0.001
Marital status (Single†)				
Married	1.89 (1.50-2.43)	<0.001	1.43 (1.10-1.90)	0.010
Cohabited	0.88 (0.38-1.65)	0.715	0.80 (0.35-1.50)	0.543
Separated	1.29 (0.69-2.15)	0.382	1.01 (0.53-1.71)	0.977
Divorced	0.98 (0.54-1.62)	0.940	0.70 (0.38-1.18)	0.219
Widowed	1.90 (1.34-2.65)	<0.001	1.23 (0.84-1.79)	0.284
Living with (Nuclear family†)				
Non-nuclear family	0.54 (0.31-0.84)	0.015	0.68 (0.39-1.08)	0.136
Alone	0.62 (0.46-0.82)	0.002	0.74 (0.54-0.97)	0.045
Smoking status (Current smoker†)				
Former smoker	2.12 (1.36-3.58)	0.002	0.74 (.55-0.99)	0.047
Never smoked	1.12 (0.75-1.84)	0.627	1.03 (0.89-1.25)	0.693
Alcohol consumption status (Current consumer†)				
Former consumer	1.86 (1.55-2.23)	<0.001	0.68 (0.59-0.78)	<0.001
Never consumed	0.90 (0.76-1.07)	0.207	1.03 (0.97-1.10)	0.403
Khat chewing status (Current chewer†)				
Former chewer	1.74 (1.18-2.56)	0.005	0.91 (0.73-1.10)	0.380
Never chewed	1.25 (0.95-1.70)	0.137	0.95 (0.86-1.06)	0.291

PR: Prevalence Ratio (unadjusted); APR: Adjusted Prevalence Ratio; CI: Confidence interval; †Reference category

Table 4. Beliefs about pain, pain and general health related factors influencing health care utilisation for LBP

Factors	PR (95% CI)	p-value	APR (95% CI)	p-value
Beliefs about LBP (Positive beliefs†)				
Negative beliefs	1.62 (1.40-1.89)	<0.001	1.72 (1.48-2.00)	<0.001
Duration of the pain (Less than one-month†)				
1-3month	1.09 (0.70-1.72)	0.713	0.92 (0.61-1.43)	0.703
Greater than 3-month, but less than one-year	1.63 (1.15-2.43)	0.010	1.18 (0.84-1.74)	0.382
1-5 years	2.12 (1.51-3.15)	<0.001	1.31 (0.94-1.94)	0.143
>5 years	2.11 (1.46-3.18)	<0.001	1.15 (0.80-1.74)	0.467
Pain spread down to the leg(s) (No†)				
Yes	1.75(1.45-2.06)	<0.001	1.26 (1.04-1.51)	0.011
Pain interference with daily activities (Not at all†)				
A little bit	2.17 (1.57-3.04)	<0.001	3.00 (1.70-4.90)	<0.001
Somewhat	3.90 (2.95-5.30)	<0.001	4.53 (2.62-7.22)	<0.001
Quite a bit	3.25 (2.41-4.47)	<0.001	3.82 (2.20-6.09)	<0.001
Very much	3.72 (2.63-5.30)	<0.001	4.86 (2.53-8.65)	<0.001
Pain interference with social activities (Not at all†)				
A little bit	1.85 (1.38-2.53)	<0.001	0.63 (0.42-1.06)	0.045
Somewhat	3.38 (2.62-4.47)	<0.001	0.86 (0.60-1.41)	0.493
Quite a bit	2.60 (1.97-3.51)	<0.001	0.66 (0.46-1.11)	0.068
Very much	2.94 (2.09-4.12)	<0.001	0.63 (0.37-1.17)	0.111
Days off work due to LBP (No†)				
Yes	4.22 (3.66-4.88)	<0.001	3.71 (3.15-4.36)	<0.001
Pain intensity (Mild†)				
Moderate	1.62 (1.37-1.90)	<0.001	1.29 (1.10-1.51)	0.002
Severe	1.31 (1.10-1.56)	0.002	1.23 (1.03-1.45)	0.018
Additional spinal pain (No†)				
Yes	2.56 (2.25-2.92)	<0.001	1.30 (1.15-1.49)	<0.001
Self-rated health status in the past year (Excellent†)				
Very good	1.46 (1.01-2.24)	0.060	1.50 (1.04-2.31)	0.042
Good	2.89 (2.01-4.40)	<0.001	3.31 (2.30-5.03)	<0.001
Fair	2.52 (1.65-3.98)	<0.001	2.89 (1.90-4.56)	<0.001
Poor	3.07 (1.88-5.04)	<0.001	3.25 (2.00-5.31)	<0.001
Self-rated current health status (Excellent†)				
Very good	1.89 (1.38-2.71)	<0.001	1.94 (1.41-2.77)	<0.001
Good	2.45 (1.79-3.49)	<0.001	2.42 (1.76-3.45)	<0.001
Fair	1.13 (0.77-1.70)	0.549	1.27 (0.85-1.93)	0.243
Poor	1.97 (1.20-3.14)	0.005	2.03 (1.24-3.26)	0.004
Depressive symptoms (Normal†)				
Borderline case	0.77 (0.65-0.90)	0.002	0.79 (0.66-0.93)	0.004
Case	0.90 (0.72-1.11)	0.348	0.85 (0.68-1.05)	0.141
Insomnia (No†)				
Yes	1.39 (1.20-1.60)	<0.001	1.34 (1.15-1.54)	<0.001

PR: Prevalence Ratio; APR: Adjusted Prevalence Ratio; CI: Confidence interval; †Reference category

Figure legends

Figure 1. Type of health facilities provided health care for people with LBP in the past year (n=543)

Figure 2. Residential area in comparison with type of health facilities provided health care for people with LBP in the past year (n=543)

Figure 3. Treatments prescribed for people with LBP in the past year (n=543)

Figure 4: A generalised representation of the Ethiopian health tier system