Prevalence of, and factors associated with, musculoskeletal pain among oral health workers in public health facilities in Kwazulu-Natal, 2016.

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ABSTRACT

Introduction

Musculoskeletal pain (MSP) is a public health concern that affects millions of people in developed and developing countries. The consequences of MSP include a wide range of negative effects such as absenteeism, increased work restriction and reduced productivity.

Aim

To determine the prevalence and factors associated with musculoskeletal pain among oral health workers in public health facilities in KwaZulu-Natal.

Methods

An observational, cross-sectional study with an analytical component was implemented. Self-administered questionnaires were utilized to determine the risk factors among dentists, dental specialists, dental therapists, oral hygienists, and dental assistants employed in the public sector in KwaZulu-Natal. Descriptive and inferential statistics were used to analyse data. Alpha level was set at $p<0.05$.

Results

The prevalence of current MSP among oral health workers (OHW) was 50.9% and the chronic prevalence of MSP reported for the previous 12 months was 60.6%. A higher prevalence of current (47.2%) and chronic (46.9%) MSP was reported among dentists when compared with dental specialists, dental therapists, oral hygienists, and dental assistants. Occupational, environmental, and psychological factors were strongly associated with MSP.

Conclusion

MSP is an occupational hazard for OHW. There is a need for educational programs and adoption of strategies to reduce occupational injuries.

ACRONYMS

BMI : Body Mass Index

CHC : Community Health Centres

KZN : KwaZulu-Natal

LBP : lower back pain

MSP : musculoskeletal pain

MSS : musculoskeletal system

OHW : oral health workers

OMPQ : Orebro Musculoskeletal Pain Questionnaire

KEY WORDS

Musculoskeletal pain, prevalence, work-related, oral health workers, risk factors, dentist, dental therapist, oral hygienist

INTRODUCTION

Musculoskeletal pain (MSP) is a public health concern that affects millions of people in developed and developing countries.1-5 MSP may originate from any part of the musculoskeletal system (MSS) such the muscles and bones.[2-3] Current MSP is pain lasting less than six weeks and chronic MSP is pain lasting for more than three months.[2-3] The most common types of MSP affecting oral health workers (OHW) are lower back pain (LBP), neck, shoulder, hand, and wrist pain.[4,6-9] OHW include dentists, dental specialists, dental therapists, oral hygienists, and dental assistants.

In 2015, musculoskeletal pain affected over 94 million people globally resulting in disability.[1] The overall global prevalence of low back pain (LBP) was 17.2%, and neck pain was 21%.[1] From 2005 to 2015, LBP and neck pain were the leading causes of years lived with disability globally.[1] MSP is reported to have a significant impact on quality of life as a result of pain and discomfort experienced by sufferers[1-5] and has a range of negative effects which include absenteeism, increased work restriction and reduced productivity.[5,8-11] Moreover, MSP-related disorders place a huge burden on health care resources, including hospitalization and other additional costs on medical bills.[5,8]

In Africa, 14% to 72% of people were reported to be affected by MSP in 2000.[12-13] Health care workers, in particular nurses, experience occupation-related MSP rates similar to those suffered by OHW. The prevalence of MSP among nurses in Africa ranges from 65.4% to 80.8%.[14-16]

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Musculoskeletal pain is a major threat in the workplace among OHW.[9,17] The key occupational risk factors for OHW are ergonomic structuring, job organization, improper work design, poor working conditions, anxiety, depression, and stress.[16, 18-20]

Studies that have been identified from South Africa focus mainly on OHW in the private sector. The prevalence and risk factors of MSP among OHW in the public sector remain unclear. The conditions of service of, and the environmental factors affecting, OHW in South Africa differ for public sector employees compared with their private sector counterparts. Hence, it will be relevant to investigate the prevalence and factors associated with MSP among OHW in the public sector.

The study sought to assess the prevalence of MSP among OHW in the public sector in KwaZulu-Natal (KZN). It investigated the risk factors associated with MSP experienced by OHW. Understanding and identifying the risk factors will help in the provision of appropriate interventions such as education programmes and training on the ergonomics of practice, intended to reduce the incidence of MSP.

METHODS

An observational, cross-sectional study design with an analytic component was implemented. The study was conducted on OHW in all public health facilities in KZN. The sample included dental departments at clinics, community health centres (CHC), and hospitals. Ethical approval to conduct the study was granted by the UKZN Postgraduate Research and Higher Education Committee, Biomedical Research Ethics Committee (BREC) (BE374/15) and the KZN Provincial Department of Health- Health Research & Knowledge Management (HRKM) (HRKM374/15 KZ_2016RP49_761) granted ethics approval as well.

All dentists, dental specialists, dental therapists, oral hygienists, and dental assistants working in the public sector for at least one year were invited to participate. Purposive sampling was used. All OHW who met this criterion (n= 320) were sent a questionnaire via email, and reminders were emailed every six weeks over a period of four months; those who had not by then completed the questionnaire were contacted by telephone.

A standardized self-administered questionnaire was used to determine the prevalence of MSP and its associated risk factors. The questionnaire was modified from the Dutch Musculoskeletal Questionnaire and the Orebro Musculoskeletal Pain Questionnaire (OMPQ).[21] The questionnaire was pre-tested through a pilot study to ensure that it was user-friendly. For the pilot study, ten OHW were randomly selected from the Gauteng public sector. The variables measured in the questionnaire included personal factors, occupational, and environmental factors, history of any MSP, and psychological factors.

The data were captured into a Microsoft Excel spreadsheet and were then exported to STATA 13. The statistical tests performed were the Chi-square test and logistic regression reporting odds ratios. All questionnaires having missing or incomplete data were omitted.

RESULTS

A total of 320 questionnaires were administered, of which 266 were adequately completed, yielding an 83% response rate. Participants in this study comprised dentists (40.6%), dental assistants (33.5%), dental therapists (13.9%), oral hygienists (9.8%), and dental specialists, (2.3%). Their average age was 34 years (standard deviation= 10.12). Most of the participants were female (71.4%), aged between 20-29 years (41.7%), with normal BMI (39.1%). The majority of OHW had worked in the dental department (74.1%) and public sector (71.8%) for less than 10 years (Table 1).

The prevalence of current MSP among OHW was 50.9% and the prevalence of chronic MSP reported for the previous 12 months was 60.6%. A higher prevalence of current (47.2%) (p=0.01) and chronic (46.9%) (p <0.001) MSP was reported among dentists when compared with dental specialists, dental therapists, oral hygienists, and dental assistants. There were significantly increasing odds of the participant who reported having MSP being a dentist (current MSP OR: 2.12; 95% CI: 1.18-3.82; chronic MSP OR: 3.63; 95% CI: 1.86-7.09).

Whilst obesity was significantly associated with chronic MSP (p=0.03; OR: 0.47) the odds of obese persons actually being affected by chronic MSP were low (Tables 2 and 3).

Overall, the most common areas of pain reported for current MSP were: lower back (n=154, 48.1%), neck (n=155, 48.4%), shoulder (n=152, 47.5%), and upper back (n=152, 47.5%). Chronic MSP affected most commonly the neck (n=185, 57.8%), lower back (n=183, 57.2%), and shoulder (n=181, 56.6%) areas (Figure 1). The most severe levels of pain experienced by OHW were reported as located in the hand, wrist and forearm.

Amongst the OHW who had worked in the dental departments for 1-10 years, 69.3% reported current and 72.7% reported chronic MSP. There was a significant association between working in the dental department for 11-20 years with current (p=0.01) and chronic (p=0.01) MSP. Working in a health facility, whether provincial (current: p<0.001; chronic: p=0.01) or district (current: p=0.01; chronic: p=0.03) was found to be associated with MSP (Tables 4 and 5).

Among workplace factors, standing and working (p<0.001), working in the same position (p=0.05), and reaching/working away from the body (p<0.001) were significantly associated with current MSP. In addition, participants who felt rushed to complete patients for the day (current MSP: OR: 4.10; 95% CI: 2.05 to 8.20; chronic MSP: OR: 2.79; 95% CI: 1.39 to 5.65) and those experiencing trembling during working (current MSP: OR: 2.77; 95% CI: 1.45 to 5.30; chronic MSP: OR: 2.15; 95% CI: 1.09 to 4.24) showed significant associations with MSP (Tables 6 and 7).

Sitting and working (p=0.01) and carrying/lifting or moving heavy materials or equipment (p=0.03) were shown to be associated with chronic MSP. Working in a cramped/awkward space showed a significant association with current (p=0.01) and chronic (p=0.03) MSP.

Several psychosocial factors were considered and a significant association was found between those suffering with mild levels of anxiety and current MSP (p=0.05). Anxiety and depression during the day were experienced by 51.5% of participants and there was a significant association (p=0.01) with current MSP (Table 8).

DISCUSSION

This study assessed the prevalence and risk factors associated with MSP among OHW working in public health facilities in KZN. The prevalence of current MSP was 50.9 % and chronic MSP was 60.6%, which is consistent with previous studies conducted among OHW (54.2 – 99.1%) in South Africa.[11, 22]

Dentists in the current study were found to have the highest prevalence of MSP when compared with dental specialists, dental therapists, oral hygienists, and dental assistants. A statistically significant positive association was found between being a dentist and current and chronic MSP. These findings are similar to the prevalence appearing in a study undertaken among private dentists (54.26%) in KZN.[22] The higher prevalence of MSP among dentists in the current investigation could be a result of the nature of the dental procedures they are expected to perform, which include tooth extractions, scalings and restorations, as well as the high volume of patients seen in most public health facilities.[9,17] A study in Poland found that 63.6% of dentists who performed dental procedures without a dental assistant assumed awkward body positions which could lead to the development of MSP.[9-10,23] In South Africa, there is one dentist for every 50,000 people, which places a great burden on public sector dentists.[24] Public sector OHW in Saudi Arabia attending to many patients in the day reported a higher prevalence of MSP compared with those attending to fewer patients .[9]

A majority of female participants suffered from current MSP (69.6%) or chronic MSP (69.9%) respectively. The findings of this study concur with studies done among OHW in Iran, China, and Saudi Arabia which

reported a high prevalence of MSP among females.[6,9,25] Public sector female OHW in Saudi Arabia were found to experience a longer duration of pain compared with males.[9] In contrast, South African male dentists reported a higher prevalence of MSP in the neck, shoulder, and lower back (79.6%, 73.3%, and 70.1%) than females (74.8%, 70.7%, and 69.1%).[26] However, no significant association was identified between gender and MSP in this study.

Overweight participants reported a higher percentage of current (35.6%) and chronic (37.6%) MSP. Obesity was significantly associated with chronic MSP in this study. Though obesity was found to be associated with chronic MSP, nevertheless a protective relationship was identified. A longitudinal population study in Norway identified that obese people had a 20% higher risk of experiencing chronic MSP compared with those of normal weight.[27] Similarly, for dentists in an Indian study, overweight and obesity were found to be associated with MSP.[23]

Among occupation-related factors, a career duration of 11-20 years of employment in the dental environment was significantly associated with current (p=0.01) and chronic (p=0.01) MSP, respectively. The findings of this study concur with a Tunisian study which reported that there was significant association between long service employment and MSP (p=0.001).[10] In addition, a study in Saudi Arabia found that the majority of participants employed in the public sector for five years or more had high prevalence of MSP.[9]

The lower back, neck, shoulder, hand, and wrist were the most painful body sites reported by OHW in this study; this is similar to the experience of OHW in the public sector in Thailand.[17] Levels of pain reported globally by OHW ranged between: lower back (54%-72.01%), neck (48%-75.74%), and shoulder (48%-69.4%) areas.[4,17,18,26]

Occupational factors were significantly associated with current MSP when participants were standing and working (p=0.00), working in the same position (p=0.05), and reaching/working away from the body (p=0.00). Tunisian health care workers were found to have occupation-related MSP caused by prolonged standing or sitting (p=0.023; p=0.016).[10] Awkward back posture while standing to extract teeth, repetitive shoulder/hand movements, and use of vibrating tools were also associated with MSP amongst OHW in the public sector from Thailand and Saudi Arabia.[9,17] Participants in the current study reported that they were unable to complete tasks due to MSP and experienced trembling while working. Dental procedures such as scaling and restoration were identified by 81% of dentists in KZN as causes of hand pain, which can be associated with trembling experienced during procedures.[7,9,11,17] Furthermore, extended hand-scaling for more than five hours per day by oral hygienists was significantly associated (p=0.05) with hand pain.[7]

Sitting and working (p=0.01) and carrying/lifting or moving heavy materials or equipment (p=0.03) were shown in this study to be associated with chronic MSP. Dental procedures while seated were considered as high risk occupation-related factors associated with MSP among public sector OHW in Thailand.[17] South African oral hygienists reported experiencing neck (66.5%) and shoulder (56.6%) pain associated with time spent on poor seating.[7] Incorrect seating position was identified as a major cause of MSP among dentists in KZN as well.[22] OHW in this study reported that working in a cramped/awkward space was strongly associated with current (p=0.01) and chronic (p=0.03) MSP. Clinical procedures were associated with neck pain resulting in the OHW rotating the neck and tilting the shoulders towards the dominant hand, causing awkward posture.[11] Lower back pain was a complaint related to inability of OHW to adjust the dental chair, resulting in standing or sitting in awkward positions.[7]

In this study, depression and anxiety were identified as affecting OHW with current MSP to an extent greater than those with chronic MSP. When participants were asked whether they suffer from anxiety/depression during the day, 51.5% reported that they did, which was significantly associated (p=0.01) with current MSP. The odds of OHW being affected by anxiety/depression during the day were lower among OHW affected by current MSP. The findings show statistical significance and may identify the risk of current MSP as a protective factor for anxiety/ depression.

Similarly, depression (p=0.001) and anxiety (p=0.001) were shown to be significantly associated with MSP in a study from the USA and Qatar.[28,29] The study in the USA found health workers with upper and lower MSP reported experiencing depression and anxiety compared with those without MSP.[28] Depression and anxiety were associated with feelings of fear, feeling "down" and hopelessness among health workers which caused interferences in their work.[28,29] Psychological factors such as depression and anxiety associated with MPS needs to further assessed and managed to prevent health workers from developing negative thoughts such as suicide.[28,29]

LIMITATIONS OF THE STUDY

The inference of a causal relationship between MSP and the various risk factors could not be determined due to the cross-sectional design of the study. The reliance on self-reporting data is a limitation of the study as participants may have over- or under-reported in the questionnaire. Direct observation was not included in the study and the accuracy of reports of the times spent in a day seated and standing while working is a limitation to the study. OHW suffering from MSP might have left the profession or had stopped working in the public sector prior to data collection. Recall bias may have affected the results as the participants were required to recall events that had transpired in the past year. In addition, the small number of participants in the sub- groups was found to be a limitation to this study. Leisure or recreational activities were not assessed although these may be aggravating factors with MSP. In addition, a limitation of the questionnaire is that test- retest reliability and content validity was not established in the modified questionnaire.

RECOMMENDATIONS

The planning of dental departments should be carefully developed to ensure that proper ergonomic practices are followed. Incorporating input from public sector departments such as dietetics and rehabilitation (physiotherapists and occupational therapists) would be helpful to assist employed OHW to achieve/maintain an ideal BMI and ensure that all are working in a proper body position during procedures. Future research needs to be conducted to investigate the influence of cumulative effects of performing various dental procedures on the occurrence of MSP. Participant observation should be conducted to determine the accuracy of reporting of posture and body positions assumed by participants. Further and more extensive research is required to assess sub- groups (dental assistants, dental therapist and oral hygienists) in detail.

CONCLUSION

MSP is an occupational hazard for OHW and the study found that the majority of dentists in this sample suffer from MSP. In addition to occupational factors such as ergonomic practices, psychological factors were found to have significant associations with MSP. There is a need for educational programs and adoption of strategies to reduce occupational injuries.

Declaration:

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This research was submitted as the dissertation component in partial fulfilment (50%) of the academic requirements for the degree of Master of Public Health in the Discipline of Public Health Medicine, School of Nursing and Public Health University of KwaZulu-Natal.

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Ethics and permissions

The researcher had obtained ethical approval to conduct the study towards the Master of Public Health degree from UKZN. The Postgraduate Research and Higher Education Committee approval was granted on 12 August 2015. The Biomedical Research Ethics Committee (BREC) granted ethics approval on 28 January 2016 (BE374/15).

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