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Ergonomics risk and neck shoulder back pain among dental professionals

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Abstract

This research was conducted to assess the ergonomic risks, the prevalence and incidence of neck shoulder back (NSB) pain among dental professionals. Subjects were 193 dentists and dental nurses working in government hospitals in Thailand. Data were collected by BRIEF (Baseline Risk Identification of Ergonomic Factors)'s survey and interviewing with the structured questionnaires. Subjects were followed-up for six-month to identify the new case of NSB pain. BRIEF's survey indicated high risk from scaling (78.8%), filling (77.7%) and tooth extraction task. Neck, followed by back area was indicated for the highest proportion on high ergonomic risk from scaling and filling task. Back pain was the highest prevalence occupied in 58.5% of participants during the previous month before beginning the cohort study. Most workers had most complaint about combination of three sites (neck, shoulder, and back) for the onset of pain (36.3%). The cohort study indicated the highest incident shoulder pain in 1- and 3- month follow-up at 15.6% and 22.9%, respectively. For 6-month follow-up, back pain was shown to be the highest incident (42.1%), followed by shoulder pain. In conclusion, NSB pain was obviously musculoskeletal health problems as a group of pain symptoms among Thai dentists and dental nurses. Each scaling, filling task indicated high ergonomics risk predominantly located on neck and back areas. 6-month incidence of NSB pain could confirm the serious musculoskeletal health problems from exposure to ergonomics risk factors. Therefore, dentists and dental nurses should be aware of NSB pain development. The hospital should support workstations and dental tools with ergonomic designs to fit to individual and task.

Keywords: BRIEF; Neck shoulder back pain; Dentist; Dental nurse; Prevalence; Incidence

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1. Introduction

Musculoskeletal pains are common in society and obvious problem related to occupation as work related musculoskeletal disorders (WMSDs). The symptoms are prevalent among workers involved physical exertion work and sedentary work. The sedentary work is defined as occasionally lifting no more than ten pounds, and sitting with occasional walking and standing. The prolonged sitting, awkward posture, repetitive motions are physical ergonomic factors related to WMSDs [1, 2]. The postures can be observed for assessment of ergonomics risk factors. Rapid Upper Limbs assessment (RULA) is a quick assessment tool for posture of neck, trunk and upper limbs along with muscle function and external loads [3]. For entire body, REBA (Rapid Entire Body Assessment) had been developed for a practitioner's field tool to the type of unpredicted working postures in health care and service industries [4]. Another technique is Baseline Risk Identification of Ergonomics Factor (BRIEF), a simple technique, which was developed for a survey of nonspecific part of body [5]. Analyses of ergonomic risks by this tool consider posture, force, duration and physical ergonomics from hazards of for example vibration, cold, light, and cumulative working hour of workers. This physical ergonomics and load related to upper limb disorders and shoulder pain among dental professionals [6].

Dental nurses and dentists are types of health care professional required a high skill job and prolonged sitting to perform daily task. Repetitive movements of upper limbs while bending trunk forwards to focus on small work pieces for oral health care of patient possibly are work ergonomic factors. Back pain was highest complaint among WMSDs in dentists that ranged from 36.3% to 60.1% followed by neck pain ranged from 19.8% to 85.0% [7]. Previous study in United State America reported the recent 12-month prevalence of neck pain and shoulder pain among dentists that were 73% and 65%, respectively [8]. The study in Thai dental professional from governmental hospital in Khon Kaen province presented also the high prevalence of neck, back and shoulder pains [9]. However, there is still no assessment on ergonomics risk among dental professionals, this study therefore aimed to assess the ergonomics risk and to investigate the prevalence and incidence of neck, shoulder and back pains among dental professionals in Thailand.

2. Materials and methods

This research was carried out in dentists and dental nurses from government hospitals in Khon Kaen province, Thailand. There were 193 dentists and dental nurses who met the study criteria included into the study and ergonomics risk identification by BRIEF^{TM} survey was performed for the baseline evaluation of ergonomic factors from 85 representative dental nurses or dentists from 85 government hospitals. Sub-district health promoting hospital, local district and tertiary hospital in Khon Kaen hospitals were included into this study by system sampling with considering the contribution numbers of hospitals from each size representative hospital and dental section. This study obtained ethical approval from Khon Kaen Universcity ethics committee, Thailand, no. HE552042 and all participants gave informed consent prior to entering the study.

2.1. Participants and data collection

Data were collected by applied techniques the BRIEF (Baseline Risk Identification of Ergonomic Factors) survey for the ergonomics risk assessment and face-to-face interviewed questionnaire. Neck, shoulder and back pain experience was asked for the base line prevalence in order to exclude subjects who had experience of moderate to severe symptom of neck, shoulder and back pain from a group of cohort study. In the cohort study, the workers who had pain experience on neck, shoulders and back areas from moderate to severe symptom were excluded before starting a prospective cohort follow-up. The baseline evaluation was performed by risk assessment with BRIEF survey.

Baseline screening data was collected by face to face interviews with the structured questions based on Chaiklieng et al. [10]'s questionnaire which was divided into 3 parts. Part 1 enquired about demographic characteristics i.e. age, gender, work experience, second job or part time job. Part 2 enquired about health status, history of trauma and accidents affecting musculoskeletal health, congenital diseases and chronic diseases affecting