

การเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงานของนิสิตทันตแพทย์ มหาวิทยาลัยศรีนครินทรวิโรฒ

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บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อเปรียบเทียบความชุกของการเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงานของนิสิตทันตแพทย์ ชั้นปีที่ 6 คณะทันตแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ กับ คณะทันตแพทยศาสตร์ มหาวิทยาลัยธรรมศาสตร์ และคณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ โดยใช้แบบสอบถามการเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงานศึกษาในนิสิตทันตแพทย์ชั้นปีที่ 6 คณะทันตแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ จำนวน 28 คน เปรียบเทียบกับ นักศึกษาทันตแพทย์ มหาวิทยาลัยธรรมศาสตร์ จำนวน 38 คน และ นิสิตแพทย์ มหาวิทยาลัยศรีนครินทรวิโรฒ จำนวน 27 คน ผลการศึกษาพบว่า ความชุกของการเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงานของนิสิตทันตแพทย์ ชั้นปีที่ 6 คณะทันตแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ แตกต่างอย่างมีนัยสำคัญกับ นักศึกษาทันตแพทย์ มหาวิทยาลัยธรรมศาสตร์ในทุกตำแหน่ง คือ ศีรษะ คอ ไหล่ทั้ง 2 ข้าง ข้อมือซ้าย หลังส่วนบน ยกเว้น ข้อมือขวา ($p > 0.05$) และเมื่อเปรียบเทียบกับนิสิตแพทย์ มหาวิทยาลัยศรีนครินทรวิโรฒ พบว่า มีเพียงข้อมือซ้ายที่ไม่แตกต่างกันอย่างมีนัยสำคัญ ($p > 0.05$) การจัดการศึกษาด้านการยศาสตร์ชั้นพื้นฐานแก่นิสิตทันตแพทย์นั้นไม่เพียงพอในการป้องกันการเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงาน

คำสำคัญ : การเกิดอาการผิดปกติของระบบกล้ามเนื้อและกระดูกจากการทำงาน การฝึกปฏิบัติงานตามระบบ ตรกรวิทยา ภัยอันตรายจากการประกอบอาชีพ

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Prevalence of Work-related Musculoskeletal Disorders in SWU Dental Students

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Abstract

The objective of this study was to assess the prevalence of work-related musculoskeletal disorders in 6th year dental students at Srinakarinwirot University (SWU) in comparison with dental students at Thammasat University (TU) and medical students. Twenty-eight 6th year dental students from SWU were surveyed by a questionnaire about the presence of several upper body musculoskeletal disorders symptoms. Their responses were compared with those of 2 different populations: 38 dental students from TU and 27 medical students from SWU. The comparison between SWU dental students and TU dental students showed that the prevalence of all symptoms was significantly different except right wrist pain ($p > 0.05$). When compared SWU dental students and medical students, only left wrist pain showed no significant difference in prevalence ($p > 0.05$). Conventional study of dental ergonomics is not sufficient to prevent Work-related Musculoskeletal Disorders.

Key words : Work-related musculoskeletal disorders, Proprioceptive derivation, Occupational diseases

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Introduction

Work-related Musculoskeletal Disorders (WMSD) is the name used by the Occupational Safety and Health Administration (OSHA) to describe a type of injury that is a result from chronic overuse or misuse of soft tissue during work [1]. The conditions classified as WMSD are inflammatory and degenerative disorders responsible for pain and functional impairment. The Dutch Health Committee has defined WMSD as a multifactorial syndrome that affects the neck and upper limbs, causing pain or functional loss [2]. Some dental practices involve working with accuracy and need more physical concentration such as operative, endodontic, periodontic, or prosthodontic treatments, thus lead to physical and emotional stress. In addition, because of restriction when working in the oral cavity, dentists or dental assistants cannot avoid to stay in static posture for a long time. In particular, dental professionals often assume positions that are uncomfortable and asymmetric, keeping the head forward and rotating to the side with the arms held out from the body. This attitude, if held for prolong period each day, tends to overstress muscles and joints, especially those of the neck, back and shoulder, causing symptoms such as headache, neck and shoulder pain, and backache [3].

There are many studies regarding WMSD experienced by persons who work in the dental field. Several studies focused on pain perception, although they varied in scope and objective, focusing at the upper back, neck, shoulders and wrists is common in all of the studies. They revealed that the average prevalence

of musculoskeletal pain is 65-81% among dentists [4-8]. The prevalence of WMSD amongst dentists varies from country to country. In a study took place in New South Wales, the prevalence of musculoskeletal problems was very high, 82% of respondents reported at least one musculoskeletal symptom during the previous month [9]. In Greece, a study using a mail questionnaire, 62% of dentists reported at least one musculoskeletal complaint, 30% with chronic complaints, 16% had spells of absence and 32 percent sought medical care [10]. In Queensland, Australia, 87% of dentists reported having experienced at least one musculoskeletal symptom in the past 12 months; 58% reported of neck pain, and 53% reported of shoulder pain [11]. In a study using a multidisciplinary approach on professionally active dentists, 42% of the dentists experienced pain and interference with daily activities from neck and shoulder problems during the preceding year [12]. One study reported that 44% of dentists suffered from neck pain and the discomfort was more than in pharmacists [13]. In Southern Thailand, an investigation of prevalence and nature of some occupationally related health problems in dental clinic revealed that 78% of dentists experienced musculoskeletal problems [8]. Wongsapai [14] studied health status of government dentists in Chiang Mai province. He found that the prevalence rate of WMSD during 6-month period was 80% of all participated dentists. It has been suggested that WMSD are associated with a number of ergonomic-related risk factors especially the working posture. In Thailand, there are 2 main different dentists' working posture

when adopting different dental work concepts, namely, proprioceptive derivation (Pd) [15] and the conventional concept. The faculty of Dentistry of SWU adopted the conventional concept while TU adopt Pd concepts. The Pd concept is a system that guides dentists in determining their most comfortable working posture and position, and help increase their awareness of the working environment and preferred working position.

The objective of this study was to assess the prevalence of work-related musculo-skeletal disorders in 6th year dental students at Srinakarinwirot University (SWU) in comparison with dental students at Thammasat University (TU) and medical students.

Materials and Methods

Subjects who participated in this study were 6th year dental and medical students studying at SWU in Bangkok, Thailand, and dental students studying at TU, Thailand. They were asked to answer a questionnaire, surveyed on musculoskeletal pain, the recent presence of the following body symptoms such as headache, neck pain, upper back pain or stiffness, and arm symptoms (pain, tingling or numbness). Students who experienced previous acute traumatic injury to the symptomatic body region and/or congenital disease of musculoskeletal system; e.g., physical scoliosis were excluded.

WMSD usually manifest as symptoms reported by the patient. The signs and symptoms are categorized by the WMSD Staging from Kroemer [16] as follows, Stage 1 is characterized by local aches and tiredness during the working hours which usually abate overnight and within

days away from work, Stage 2 showing symptoms of tenderness, swelling, numbness, weakness, and pain that starts early in the work shift and do not abate overnight, Stage 3 is characterized by symptoms that persist at rest and during the night; pain occurs even with non-repetitive movements; and sleep is disturbed. These symptoms were chosen because the neck and upper back are the body sites most affected by altered posture during dental work, and problems at those locations may lead to referred symptoms such as headache and arm symptoms. The reported symptoms were compared by means of Chi-square tests.

Results

All of SWU dental students returned a completed questionnaire (n = 28; 5 men and 23 women). The students, age range is from 23 to 24 years (mean 23.36 years). Responses were obtained from 27 SWU medical students (n = 27; 12 men and 15 women, mean age 21.85 years, range 21–23 years). All of TU dental students returned the questionnaire (n = 38; 9 men and 29 women, mean age 23.18 years, range 22–30 years). Comparison of results between SWU dental students and TU dental students (Table 1), showed that only more right wrist pain had no significant difference among groups of dental students ($p > 0.05$). There were significant differences between the 2 groups of dental students for left and right headache, left and right neck pain, left and right shoulder pain, left wrist pain, left and right upper back pain. ($p < 0.05$).

In the comparison of SWU dental students and medical students (Table 2), only left wrist pain had no significant difference ($p > 0.05$).

Table 1 Prevalence of symptoms and statistic analysis for comparison of SWU and TU dental students.

Stage of symptom	No. (and%) of students with/ without symptoms								χ^2	P (df=1)
	Dent SWU (n=28)				Dent TU (n=38)					
	0	1	2	3	0	1	2	3		
Left headache	6 (21.43)	12 (42.86)	10 (35.71)	0 (0)	16 (42.11)	13 (34.21)	9 (23.68)	0 (0)	3.196	0.032
Right headache	6 (21.43)	10 (35.71)	12 (42.86)	0 (0)	15 (39.47)	16 (42.11)	7 (18.42)	0 (0)	5.161	0.012
Left neck pain	3 (10.71)	12 (42.86)	13 (46.43)	0 (0)	15 (39.47)	14 (36.84)	9 (23.69)	0 (0)	7.539	0.004
Right neck pain	2 (7.14)	13 (46.43)	13 (46.43)	0 (0)	13 (34.21)	15 (39.47)	10 (26.32)	0 (0)	7.252	0.006
Left shoulder pain	6 (21.43)	7 (25)	11 (39.28)	4 (14.29)	18 (47.37)	15 (39.47)	5 (13.16)	0 (0)	13.965	0.000
Right shoulder pain	6 (21.43)	6 (21.43)	14 (50)	2 (7.14)	19 (50)	13 (34.21)	6 (15.79)	0 (0)	13.330	0.000
Left wrist pain	16 (57.14)	8 (28.57)	2 (7.15)	2 (7.14)	29 (76.32)	9 (23.68)	0 (0)	0 (0)	6.447	0.010
Right wrist pain	11 (39.29)	10 (35.71)	15 (17.86)	2 (7.14)	19 (50)	13 (34.21)	6 (15.79)	0 (0)	3.173	0.051
Left upper back pain	5 (17.86)	13 (46.43)	8 (28.57)	2 (7.14)	13 (34.21)	18 (47.37)	7 (18.42)	0 (0)	5.029	0.015
Right upper back pain	5 (17.86)	13 (46.43)	8 (28.57)	2 (7.14)	14 (36.84)	16 (42.11)	8 (21.05)	0 (0)	5.177	0.016

Dent SWU = dental students from Srinakharinwirot University

Dent TU = dental students from Thammasat University

df = degrees of freedom

Table 2 Prevalence of symptoms and statistic analysis for comparison of medical and dental students in SWU.

Stage of symptom	No. (and%) of students with/ without symptoms								χ^2	P (df=1)
	Dent SWU (n=28)				Dent TU (n=38)					
	0	1	2	3	0	1	2	3		
Left headache	20 (74.07)	5 (18.52)	2 (7.41)	0 (0)	6 (21.43)	12 (42.86)	10 (35.71)	3 (0)	15.741	0.000
Right headache	22 (81.48)	4 (14.82)	1 (3.70)	0 (0)	6 (21.43)	10 (35.71)	12 (42.86)	0 (0)	21.011	0.000
Left neck pain	16 (59.26)	6 (22.22)	5 (18.52)	0 (0)	3 (10.71)	12 (42.86)	13 (46.43)	0 (0)	14.437	0.001
Right neck pain	18 (66.67)	5 (18.52)	4 (14.81)	0 (0)	2 (7.14)	13 (46.43)	13 (46.43)	0 (0)	21.109	0.000
Left shoulder pain	16 (59.26)	5 (18.52)	5 (18.52)	1 (3.70)	6 (21.43)	7 (25)	11 (39.28)	4 (14.29)	8.914	0.030
Right shoulder pain	18 (66.67)	5 (18.52)	3 (11.11)	1 (3.70)	6 (21.43)	6 (21.43)	14 (50)	2 (7.14)	13.528	0.004
Left wrist pain	22 (81.48)	4 (14.81)	0 (0)	1 (3.70)	16 (57.14)	8 (28.57)	2 (7.15)	2 (7.14)	4.597	0.204
Right wrist pain	21 (77.78)	4 (14.81)	2 (7.41)	0 (0)	11 (39.29)	10 (35.71)	5 (17.86)	2 (7.14)	8.967	0.030
Left upper back pain	17 (62.97)	6 (22.22)	3 (11.11)	1 (3.70)	5 (17.86)	13 (46.43)	8 (28.57)	2 (7.14)	11.716	0.008
Right upper back pain	16 (59.26)	7 (25.93)	3 (11.11)	1 (3.70)	5 (17.86)	13 (46.43)	8 (28.57)	2 (7.14)	10.153	0.017

Dent SWU = dental students from Srinakharinwirot University

Med SWU = medical students from Srinakharinwirot University

df = degrees of freedom

Discussion

There were statistically significant differences between 2 groups of dental students for left and right headache, left and right neck pain, left and right shoulder pain, left wrist pain, and left and right upper back pain. Working environment plays a major role in the development of many musculoskeletal problems, although most of them can be avoided or at least reduced with more attention to ergonomics [5]. The Dental Faculty of SWU and TU have employ different in dental work concepts. SWU applied the conventional concept while at Thammasat University, dentists' working posture were adopted different, using Pd concept [16,17]. It focuses on the positions, movements, contacts and comfort that dentists can sense with their bodies. However, the higher prevalence in SWU dental students in this study may be a result of the earlier year of training which means there were more time spent in practice compared to TU dental students. Only the prevalence of right wrist pain showed no difference between 2 dental student groups, 60.71% among the SWU dental students (stage 1 = 35.71%, 2 = 17.86%, 3 = 7.14%) and 50% (stage 1 = 34.21%, 2 = 15.79%, 3 = 0%) among the TU dental students. Wrist pain was significantly found more in female dentists [11]. Marshall et al. reported that symptoms were more common in the dominant arm of dentists than the non-dominant arm [3].

When comparing medical and dental students from SWU, it was found that only left wrist pain has no significant difference. The previous studies have suggested a higher prevalence of WMSD among dentists, especially when compared other occupations, where body positioning is more natural [18]. The nature of

dentistry requires extremely fine motor coordination of the dominant hand, and sometimes forceful grips. This is of pathogenetic importance, thus the prevalence of wrist pain was common in dominant hand. In Thailand, it was found that right handedness is around 93.3% [19]. However, information of this nature was not collected for the student groups assessed in this study.

Conclusion

Conventional concept in dental studies and dental work often involves time spent in static, uncomfortable positions, which lead to more prevalence of musculoskeletal symptoms.

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