Posture Work to Complaint Musculoskeletal Disorders at the Dentist

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Abstract

Musculoskeletaldisordersoftenoccurin health practitioners because ofwork position less ergonomic and occurred atlongtimeand repetitive. health practitioners which susceptible tomusculoskeletaldisordersare dentists.

To analyze the factors affecting the work posture complaintsmusculoskeletaldisordersin dentistatTasikmalaya of the Year 2016.

The study is an observational study analytic using cross sectional design involved 35 Dentist done in Tasikmalaya. The study was conducted using questionnaires Nordic Body Map, directobservationonthework positionwhile dental fillings, extractions and scaling, and measurement working position using REBA worksheets.

The results of the bivariate test showed meaningful relationships between variable working posture while extracting teethwithmusclepain (p value <0.05). multivariat analysis showed that work position while extracting teeth was teh only factor which predicts the occurence of musculoskeletaldisorders.

The study found that the dentistwho have risk working posture while extractions likely exposed complaints 55.53% Muscle Pain (MSDS) compared dentistwho has not work posture risky while extracting teeth.

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Introduction

Musculoskeletal disorders is a disease that causes prolonged pain. A person suffering from musculoskeletal disorders feel complaints ranging from mild to severe if the muscles receive static load repeatedly and over a long time.The incidence of musculoskeletal disorders is related to working conditions and how the support so that this condition can cause damage to muscles, nerves, tendons, joints, cartilage, and vertebral discs[1].

Musculoskeletal disorders that often occur in healthcare practitioner. This occurs as a result of the body position while working less ergonomic and happened in a long time and repeatedly. Among the health practitioners who are vulnerable in the face of the threat of a musculoskeletal disorder is a dentist[2].

One cause of musculoskeletal syndrome at the dentist because the dentist only cares about the comfort of patients treated, but less attention to comfort themselves when caring for patients. Dentists consider that they should move toward the patient, rather than set up a sitting position on a chair dental patients[3].

The risk factors are affected by the disruption musculoskeletal dentist is multifactorial. Generally, it can be Categorized into two parts items, namely biomechanical and psychosocial. Various risk factors include posture, static and stiff (especially the neck and shoulders), repeated movement and arm strength in care, especially in the extraction of teeth (it is associated with the condition of the hands and arms), poor lighting (both light intensity and positioning of dental lamp unit), improper position between patient and dentist, condition and design instruments that are not ergonomic, individual characteristics (physical condition, height, weight, general health, the type of sex

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and age), and the stress of working poor[1,5].

Musculoskeletal problems have become a significant issue for the profession of dentistry and dental hygiene. The prevalence of musculoskeletal pain at the dentist diYunani (62%), India (81.06%), Saudi Arabia (85%) and China (88%)[4,6,7,8].

Overview musculoskeletal disorders at the dentist at the health center in Surabaya as follows: Most of the respondents (94.2%) had experienced musculoskeletal disorders. Impaired musculoskeletal most often experienced in the neck (63.3%), followed by the shoulder (55%), upper arm right (58.3%), right wrist (45%), upper back (50%) and lower back (51.7%). 57.5% of respondents also said that musculoskeletal disorders causing stress at work[9].

Based on the initial survey I did on 7 May 2015, from 23 dentists in Tasikmalaya Municipalities showed that as many as 20 people (86.95%) complained of pain in the muscles especially the back of the back.

Therefore, researchers are interested inanalyze the risk factors for musculoskeletal complaints against the work posture of dentists in the municipality of Tasikmalaya 2016.

Materials and methods

This research is an analytic observational research using cross sectional design. The population in this study are all dentists in the city of Tasikmalaya in 2016 as many as 35 people. The sampling technique in this study using Random Sampling. Implementation of research done in February-April, 2016.

The independent variables in this study are gender, age, years of work posture at the time of filling, the working posture when scaling, working posture at the time of revocation. The dependent variable ie muscle pain / musculoskeletal diseases.

Collecting data in this study used: digital cameras for documenting posture / drawing activities of dentists, protractor to measure the degree posture, Worksheet REBA to measure the risk of ergonomic work related to the working posture, and Questionnaire Nordic Body Map to determine the level of complaints MSDs perceived dentist, by filling out the form questionnaires provided.

The statistical test used is A univariate analysis performed for each - each variable, analysis bivariate with chi-square test or Fisher exact to determine the relationship between each - each risk factor to complaints MSDs, multivariate analysis using logistic regression to determine the risk factors of the most dominant on the incidence MSDs at the dentist.

Results

Subjects 35 people, mostly women 71.4%, while male - 28.6% respondents. Age is the most in the group ≥ 40 years as much as 51.4% and <40 years of as much as 48.6%. Most respondents tenure in the group over 10 years 65.7% of respondents who have a service life of between 6-10 years and as much as 14.3% of respondents who have a working period of fewer than five years as much as 20%.

REBA value at the time of filling the majority of respondents, including the risk of being as much as 94.3% and the respondents including low risk as much as 5.7%.Value REBA respondents at the time of scaling everything including the risk of being as much as 100%. REBA value at the time of the extraction of respondents are respondents dentist has the risk of being as much as 97.1%, and respondents dentists have a high risk as much as 2.9%.

Results REBA value data distribution is not normal. Therefore, the value of REBA respondents was categorized into 2 groups based on the median value is the working posture is not at risk if the value of REBA <median and risky work postures when REBA ≥ median value.Then showed the following results: the act of dental fillings majority of respondents have a working posture at risk as much as 77.1% compared to the working posture is not at risk, the scaling majority of respondents have a working posture at risk as much as 80% compared to the working posture is not at risk, and the measures tooth extraction the majority of respondents have a working posture as much as 80% compared to the risky work posture is not at risk.

Distribution of respondents most often complains of muscle pain (MSDs) as much as 60% compared to respondents who did not complain of muscle pain (MSDs) as much as 40%. The body parts most experienced muscle pain (MSDs) are the waist as much as 100%, 94.3% right shoulder and upper back as much as 91.4.

Characteristics		Total	%
Gender			
	Women	25	71.42 %
	Men – men	10	28.57 %
Age (years)			
	< 40 years	17	48.57 %
	≥ 40 years	18	51.42 %
Working Period			
	≤10 years	12	34.28 %
	> 10 years	23	65.71 %
Working Posture Feeling Teeth			
	Risky	27	77.14 %
	Not At Risk	8	22.85 %
Working Posture For The Extraction Of Teeth			
	Risky	28	80 %
	Not At Risk	7	20 %
Work Posture Scalling			
	Risky	28	80 %
	Not At Risk	7	20 %
Complaints Of Muscle Pain			
	Sick	21	60 %
	Painless	14	40 %

Table 1. Frequency Distribution of Respondents.

Variabel	Complaints Muscle Pain				OR	95% CI	P
	Sick (n=21)		Painless (n=14)				
	N	%	N	%			
Gender							
Women	15	60	10	40	1	0.224-4.468	0.644
Men – men	6	60	4	40			
Age (years)							
≥ 40 years	8	44.4	10	55.6	0.246	0.057-1.056	0.053
< 40 years	13	76.5	4	23.5			
Working Period							
≥ 10 years	12	52.2	11	47.8	0.364	0.078–1.699	0.173
<10 years	9	75	3	25			
Working Posture Feeling Teeth							
Risky	18	66.7	9	33.3	0.873	0.172-4.429	0.143
Not At Risk	3	37.5	5	62.5			
Working Posture For The Extraction Of Teeth							
Risky	20	71.4	8	28.6	15	1.549-145.225	0.010
Not At Risk	1	14.3	6	85.7			
Work Posture Scalling							
Risky	19	67.9	9	32.1	5.278	0.854-32.624	0.072
Not At Risk	2	28.6	5	71.4			

Table 2. The relationship between individual characteristics, work attitudes and exercise habits complaints of muscle pain (muscle disease).

From the results of bivariate statistical test results as follows: the variable working posture at the time of tooth extraction p-value <0.05 which means that there is a relationship between the working posture at the time of tooth extraction on the complaint of muscle pain (MSDs). As for the variables gender, age, years of work postures dental fillings, scaling work

posture bivariate test result value of p> 0.05 which means there is no relation to complaints of muscle pain (MSDs).

From this bivariate test results, the variable has a value of p <0:25 put into test multivariate logistic regression with backward method L / R and obtained the following results.

Model 4	B	S.E	Wald	Df	Sig.	Exp(B)	95% C.I for Exp (B)	
							Lower	Upper
Working Period	-1.877	1.184	2.515	1	.113	.153	.015	1.557
REBAScaling	2.569	1.327	3.750	1	.053	13.049	.969	175.692
REBAextraction tooth	3.324	1.444	5.297	1	.021	27.775	1.638	470.990
Constant	-3.102	1.644	3.561	1	.059	.045		

Tabel 3. Results Logistic regression analysis Dual Independent Variable toVariable Complaints Muscle Pain (MSDs) at Dentist in Tasikmalaya.

From the results of multivariate analysis found that one independent variable which affects the muscle pain (MSDs) are Posture Working (REBA) of respondents at the time of the revocation of the 0021 significant (p value <0.05), the value OR (Exp B) amounting to 27 775.While working lives and REBAscaling variables as confounding variables (p values> 0.05). It means that respondents with work posture (REBA) risk at the time of the revocation are possibly 27 times greater risk of muscle pain (MSDs) compared to respondents with work posture (REBA) are not at risk at the time of revocation.The result of the calculation of the probability of complaints of muscle pain (MSDs) on the dentist is 55.53% which means that the respondents have a working posture that is risky at the time of tooth extraction, it will have a probability/likelihood of complaints of muscle pain (MSDs) amounted to 55.53%, after the control variable more.

Discussion

In research done at the dentist in Denmark who observed the work posture in three measures of dental care that examination, dental fillings and tartar cleaning / scaling and linking with pain muscle obtained the following results that the work posture dentists which position the neck that much bending / flexion during the act of dental care, as well as the upper arm that is away from the long axis / abduction as static when holding the glass mouth during the act, the

results obtained in the examination electromyograph found static muscle highest of the trapezius muscle (back) and muscles splenius (neck)[10].

The prevalence of this case Musculoskeletal disorders in different global studies reported in the back, neck, shoulders, and arms from 64% to 93%. In the dental practice due to repetitive movements, working in long-term static postures, working conditions are not appropriate and that the use of ergonomic tools are not often causing Musculoskeletal disorders[11].

Poor eyesight can lead dentists tend bent toward the patient so you can easily see the work area. This can cause strain on the discs, ligaments, and muscles in the neck area. If this position is maintained for hours - hours, it will cause Musculoskeletal disorders. For dentists with inadequate vision, can use dental loupe magnifying tool or as a tool to see. This tool prevents the bent position toward the mouth of the patient[3].

This study observed the activities of dentists for conducting dental fillings, tartar cleaning (scaling) and tooth extraction activities.

1. Posture Working in dental fillings's activities

In observational studies conducted on all students working in the clinic FKG UI found in dental fillings action, students who experienced mild Musculoskeletal disorders were 3 people (3.8%) and Musculoskeletal disorders were as many as three people (2.2%)[12].

Activities dental fillings include activities that are often carried out by a dentist. These activities are often carried out in a state of posture neck too down and body leaning forward, left or right foot stepped on the pedal control, the right hand is always moving - moving from the patient's mouth to counter dental unit and left hand still and holds a mirror mouth during the process of dental fillings. The procedure is time-consuming and repetitive - again often causing muscle pain at the dentist.

Skeletal muscle complaints generally occur due to excessive muscle contraction as a result of the provision of the workload is too heavy with long duration of loading. Excessive muscle contractions cause the blood circulation to the muscles is reduced so that the supply of oxygen to the muscles decreases, the metabolism of carbohydrates inhibited and consequently the accumulation of lactic acid that causes pain in the muscles. Work with a bent position has a risk of injury to the musculoskeletal system[13,17].

Recommended actions by rating REBA during dental fillings activity, in an effort to prevent the occurrence of musculoskeletal complaints (MSDs), is required remedial action. Action is needed on preventing MSDs are making changes to the working environment in this case is the location of the position of the pedal control, positioning tables dental unit, and the position of chair dental unit that is adapted to the body of the operator and the location of the gear to be done, and do stretching before and after work.

2. Posture Working At The Reef Cleanup Activities Dental / Scaling

Recommended actions by rating REBA when the activity scaling, in efforts to prevent the occurrence of musculoskeletal complaints (MSDs) is required remedial action.

In the observational study conducted on all students who work in the clinic FKG UI found on the cleaning action of tartar (cleaned), students who experienced mild musculoskeletal disorders as many as 32 people (33.9%) and Musculoskeletal disorders are as many as 22 people (20.1 %)[12].

In a study to observe student work postures during tartar cleaning (scaling) in the Faculty of Dentistry, University of Indonesia based on the results of Nordic Body Questionnaire there are complaints MSDS, and the symptoms experienced in the neck, shoulders, lower back, and upper back. Postural analysis results showed students at risk of MSDs when treating patients at each quadrant. It scaling is the caused by awkward work postures[14].

Activities tartar cleaning / scaling is a routine activity performed by a dentist. Posture is a dentist at the time of this activity is often leaning forward body and neck to bend down to get a sufficient field of vision. This process is done in a long time. The right hand is grasping a tool to scrape tartar also need a strong force and repetitive - again, the left hand in a static position during work procedures for holding a mouth mirror.

This is consistent with the results of research that says that the attitude of the work during the scaling procedure is the factor most

risky risk for work related disorders Musculoskeletal disorders (WRMDs)[15].

3. Posture Working At The Tooth Extraction Activities

In observational studies conducted on all students working in the clinic FKG UI found on the actions of a tooth extraction, students who experienced mild Musculoskeletal disorders as many as five people (3.1%) and Musculoskeletal disorders being counted 0 (0%)[12].

Dentist working posture is a risk factor for the disorder Musculoskeletal. Many studies have reported on the prevalence of musculoskeletal dentist. As we know, maintaining poor posture in the long term can lead to muscle fatigue, discomfort or pain[15].

Static work posture with muscles that are too long and with a high weight-bearing joints that can lead to changes in soft tissue, and with the passage of time can cause pathological effects. Variations in work posture can reduce the risk of excessive load on the spine and lower limbs and over[16].

The most common musculoskeletal complaints in the back, this can be attributed to operator position leaning forward to gain access to the patient's oral cavity. Bend forward posture is not only caused the extensor muscles are contracting, but also causes ischemia and excessive tension sparking myofascial trigger points in the lower back muscles[16].

The risk factors with respect to the dentist's office, observing from sitting settled when treating patients, the posture of the neck, shoulder and wrist, arm strength at the time of tooth extraction, repetitive motions - again while doing maintenance cleaning tartar and duration of the stress of the moment the injection (anesthesia), a collection of symptoms of pain in the fingers invitation dentist is higher than the general population[3].

Conclusions

There is no significant relationship between the variables of sex, age, year, posture when dental fillings repeal, repeal the current posture of tartar cleaning. While working posture when extractions significant effect on muscle pain complaints (MSDs).

Declaration of Interest

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References

1. Valachi B, Valachi K. Preventing Musculoskeletal Disorders In Clinical Dentistry: Strategies To Address The Mechanisms Leading To Musculoskeletal Disorders. The Journal of the American Dental Association. 2003;134(12):1604-12.
2. Saleh M, Miko H, Triyanto R. Musculoskeletal Disordersand Cumulative Trauma Disorders In Dental Practitioner. Actual Research Science Academic. 2016;1(1):1-10.
3. Andayasari L, Anorital A. Gangguan Muskuloskeletal Pada Praktik Dokter Gigi Dan Upaya Pencegahannya. Media Penelitian dan Pengembangan Kesehatan. 2012;22(2).
4. Alexopoulos EC, Stathi IC, Charizani F. Prevalence Of Musculoskeletal Disorders In Dentists. BMC Musculoskeletal Disorders. 2004;5(1):16.
5. Gupta A, Ankola AV, Hebbal M. Optimizing Human Factors In Dentistry. Dental Research Journal. 2013;10(2):254.
6. Sahu D, Tandon S, Dhingra S, Chinmaya BR, Prasad S, Bali E, Ghosh A. Prevalence of musculoskeletal disorders among dentists: A pilot cross-sectional survey. Journal of Indian Association of Public Health Dentistry. 2015;13(3):307.
7. Alghadir A, Zafar H, Iqbal ZA. Work-related musculoskeletal disorders among dental professionals in Saudi Arabia. Journal of physical therapy science. 2015;27(4):1107-12.
8. Feng B, Liang Q, Wang Y, Andersen LL, Szeto G. Prevalence of work-related musculoskeletal symptoms of the neck and upper extremity among dentists in China. BMJ open. 2014;4(12):e006451.
9. Klana NA. Gangguan muskuloskeletal pada praktik dokter gigi puskesmas di surabaya (Perpustakaan Universitas Airlangga);2013.
10. Finsen L, Christensen H, Bakke M. Musculoskeletal disorders among dentists and variation in dental work. Applied ergonomics. 1998;29(2):119-25.
11. Hayes MJ, Cockrell D, Smith DR. A systematic review of musculoskeletal disorders among dental professionals. International journal of dental hygiene. 2009;7(3):159-65.
12. Wijaya AT, Darwita RR, Bahar A. The relation between risk factors and musculoskeletal impairment in dental students: a preliminary study. Journal of Dentistry Indonesia. 2011;18(2):33-7.
13. Hildebrandt VH, Bongers PM, Dul J, Van Dijk FJ, Kemper HC. The relationship between leisure time, physical activities and musculoskeletal symptoms and disability in worker populations. International archives of occupational and environmental health. 2000;73(8):507-18.
14. Muslim E, Nurtjahyo BM, Darwita RR, Widinugroho BP. Working Posture Evaluation of Clinical Student in Faculty of Dentistry University of Indonesia for the Scaling Task in Sitting Position in a Virtual Environment. Makara Journal of Health Research. 2012;36-44.
15. Akesson I, Lundborg G, Horstmann V, Skerfving S. Neuropathy in female dental personnel exposed to high frequency vibrations. Occupational and Environmental Medicine. 1995;52(2):116-23.
16. Puriene A, Aleksejuniene J, Petrauskiene J, Balciuniene I, Janulyte V. Self-reported occupational health issues among Lithuanian dentists. Industrial health. 2008;46(4):369-74.
17. Meral Huri, Nilsun Bagıs, Hakan Eren et al. Association Between Burnout and Depressive Symptoms Among Turkish Dentists. Journal of Dental Science. 2016;11(4):353-359.