

Working position and low back pain complaint of Dental Therapist in Pati, Indonesia

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Abstract: Working position is the posture formed naturally of body which interact with facility workers and work habits in a clinical job. The effectiveness of a treatment is influenced by work posture. Ergonomic work posture produces good output, and vice versa. In addition, an ergonomic work position needs to be considered to prevent complaints from work-related diseases. Low back pain is a condition with discomfort or acute pain in the fifth and sacral lumbar region (L5-S1). The purpose of this study was to determine the relationship between demographic characteristic and work position with complaints of low back pain in dental therapists in Pati, Central Java Indonesia. Design research is an observational study with cross sectional approach. Population is all dental therapist, and sample is 37 of those who selected purposively. Respondent characteristic, complaint of low back pain was collected by questionnaire and determined of work position was by Rapid Entire Body Assessment (REBA). Relation of variables was analyzed by Chi Square test. Research study found no relationship of age, gender, and body mass index with complain of low back pain ($p = 0.122$; 0.816 ; 0.761 and 0.208 respectively), in addition variable length of working and working position were significantly has relation ($p = 0.01$ and 0.02). Dental therapist need to concern with their working position to prevent of their complaint of LBP.

KeyWord : working position, low back pain, REBA test

1. INTRODUCTION:

Dental therapist is a part of health workers who has risk of low back pain (LBP) related with working position as their role assist dentist at dental clinic. LBP is one most prevalent work-related musculoskeletal disorder, Every year 15-45% of adult has low back pain and mostly at age 35-55 years old. Proportion of those who has to be hospitalized is about 5%.¹ In United States also found about 3.6 million outpatient visits hospital suffer low back pain.² LBP also mostly cause physical disturbance among adult population in Europe, around eight in every ten people.³

Activities that are not good or correct include the position when lifting heavy weights, standing for a long time and being carried out continuously, the position of looking forward with the shoulders bowed forward. This causes excessive contraction of the lower back muscles and puts excessive pressure.⁴ Dental clinic is a collaborative work area for dentists and dental therapists in providing dental and oral health services. Each profession carries out its duties according to its authority.

Role of dental therapist in dental clinic are as dental assistant which has task tasked with helping the dentist prepare tools, control saliva, prepare materials, clean the mouth and adjust the light while a treatment procedure is being carried out. Another role as dental hygienist with task filling in medical records, performing preventive dentistry measures.⁵ Those two roles mostly done manually which includes lifting, pushing, pulling, lifting, raising, lowering an object from a certain place or dimension and load.

The such work position results in the use of the body in certain postures that are carried out repeatedly, causing occupational diseases, one of which is low back pain. Dental therapists who experience low back pain problems will be disturbed by their work productivity. Decreased work productivity ultimately has an impact on the quality of dental and oral health services.⁶

Demographic, occupational and individual factors are recognized as important risk factors associated with an increasing burden of LBP among dentists.⁷ However, limited study about dental therapist and their risk related work. Purpose of the study to find relation of age, gender, body mass index, work position and period of employment of Dental therapist and their complaint of low back pain.

2. MATERIAL AND METHODS:

Research design was observasional study with cross sectional approach. Site study is at Pati regency, Central Java Indonesia with around 37 dental therapist who work at Community Health Services, Hospital and private practice. Age, gender, body mass index as characteristic of respondent and complaint of low back pain was collected with questionnaire, and their working position was observationally using Rapid Entire Body Assesment (REBA). Age divided into 2 groups (young and old dental therapist), gender was divided into male and female, body mass index divided into 3 groups based on height and weight (thin, normal, fat); length of employment divided into 2 groups (more and less of 4 years); working position divided into 2 (high and low risks) and complaint of LBP devided into 4 levels (no pain, mild, moderate and severe pain). Three enumerators who observe respondents are dentists which already validated for their observation with REBA analyse. Statistic test for analyzing the relation among variables is Chi Square test.

3. RESULTS:

Table 1. Relation of age and complaint of lower back pain

age	Complaint of lower back pain				Total	Chi square
	No pain	Mild pain	Moderate	Severe pain		

					pain						p=0.122
	n	%	n	%	n	%	n	%	n	%	
≤ 35 Th	6	40	2	13.3	7	46.7	0	0	15	100	
> 35 Th	6	27.3	0	0	15	68.2	1	4.5	22	100	
Total	12		2		22		1		37	100	

Based on table 1, most senior respondent had mild pain (68.2%), meanwhile at junior respondents almost same which no pain and mild pain. No relationship between age and complaint of LBP (p=0.122).

Table 2. Relation of gender and complaint of lower back pain

Gender	Complaint of lower back pain								Total		Chi square
	No pain		Mild pain		Moderate pain		Severe pain				
	n	%	n	%	n	%	n	%	n	%	p=0.816
Male	1	25	0	0	3	75	0	0	4	100	
Female	11	33.3	2	6.1	19	57.6	1	3	33	100	
Total	12		2		22		1		37	100	

Table 2 shown most of respondents are female (33 of 37 dental therapists). Most of respondents, both male and female has lower back pain categorized mild pain and no relationship of gender and complain of lower back pain (p=0.816).

Table 3. Relation of body mass index (BMI) and complaint lower back pain

BMI	Complaint of lower back pain								Total		Chi square
	No pain		Mild pain		Moderate pain		Severe pain				
	n	%	n	%	n	%	n	%	n	%	p=0.761
Thin	0	0	0	0	1	100	0	0	1	100	
Normal	9	34.6	2	7.7	14	53.8	1	3.8	26	100	
Fat	3	30	0	0	7	70	0	0	10	100	
Total	12		2		22		1		37	100	

Only one thin respondents and has moderate pain, and dental therapist which categorized normal BMI more than half experienced moderate LBP and also for those who categorized fat 70% has moderate pain. There was no relationship of BMI and complaint of LBP.

Table 4. Relation of length of working and complaint of lower back pain

Length	Complaint of lower back pain	Total	Chi
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of working	No pain		Mild pain		Moderate pain		Severe pain				square p=0.011
	n	%	n	%	n	%	n	%	n	%	
≤ 4 year	6	85.7	0	0	1	14.3	0	0	7	100	
>4 year	6	20	2	6.7	21	70	1	3.3	30	100	
Total	12		2		22		1		37	100	

Table 4 showed 85.7% respondents who works less than 4 years has no pain of their lower back and only one (1) who has moderate pain. On contrary 70% of respondents who works more than 4 years has moderate LBP. There was a relationship of length of working and complaint of lower back pain.

Table 5. Relation of working position and complaint of lower back pain

Working position	Complaint of lower back pain								Total		Chi square p=0.02
	No pain		Mild pain		Moderate pain		Severe pain		n	%	
	n	%	n	%	n	%	n	%			
High risk	2	9.5	5	23.8	13	61.9	1	4.8	21	100	
Low risk	11	68.8	2	12.5	3	18.7	0	0	16	100	
Total	17		4		16		1		37	100	

Table 5 showed a relationship of working position and complaint of lower back pain. Dental therapist which categorized high risk the highest respondents has moderate pain (61.9%) meanwhile those who categorized as low risk most of them complaint of lower back pain as no pain (68.8%).

4. DISCUSSION:

This study found more than half (56.8%) of dental therapist asrespondents have high risk of incidence LBP,slightly higher compared to research among school teachers in China which found 45.6% had risk of LBP and among KTI staff during the past 12 months was 61.4%.⁹ Instrument used in the recents study for determining risk of LBP is REBA which two dentists watched unnoticed when the respondents work at dental clinic. Quick observation might be not precise at the time at determination, therefore more respondents found at high risk. Clinic setting and also dental unit used by dentist and dental therapist might be also not suitable for them to work properly.

Table 1 found age of dental therapist has no association with complaint of LBP, both of two group stated that they had complaint of moderate pain. Respondents has moderate pain as their activity in dental service which sometimes static and dynamic moving at quite long time. Age of respondents in recent study has no far from range, the oldest is 45 years old and the youngest is 30 years old, therefore they have no big gap at level of complaint of LBP. A

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study found the prevalence and incidence of severe and chronic LBP increase with increase of age.¹⁰ Older people aged 80 years old above has more risk 3 times compared to people with aged below 60. Older people, 60 years old above are the most age group who visit physicians for treat LBP.¹¹ Internal body organ will decline its function when aged increase.

Men and women have the same risk of experiencing low back pain until the age of 60 years, over the age of 60 women have a greater risk of experiencing low back pain because they have a greater tendency to develop osteoporosis.¹² Recent study have similar finding with a research at Manado which found there is no relationship between gender and complaints of low back pain in nurses in the inpatient room of GMIM Hospital.¹³ A Spanish study found that the prevalence rates of chronic LBP among females and males aged 65 years or older were 24.2 and 12.3%, respectively.¹⁴

Another variable that is characteristic in this study is length of working, which is one of the factors can trigger emergence of musculoskeletal disorders caused by work. Workers with increased tenure will perform the same and repetitive movements. Such position can trigger tissue fatigue, in this case muscle tissue which can cause overuse, and muscle spasm. The emergence of this condition as a physiological effect of muscles to maintain or prevent further damage to a tissue, this muscle spasm is a response from the body to provide information to ourselves to end the activities carried out and immediately rest so that the body can be well maintained. In addition, a long working period will cause the disc cavity to constrict permanently and will result in spinal degeneration which will cause LBP.¹⁵ Tenure causes a continuous static load, if workers do not pay attention to ergonomic factors, it will be easier to cause complaints of lower back pain.¹⁶ A related research which focus on ergonomic risk and complaint of LBP at nurse which found that workers who have worked for more than 4 years have a risk of 2.755 times compared to workers with a work period of ≤ 4 years.¹⁷

Increased BMI can cause abdominal muscle tone to weaken, therefore the center of gravity will be pushed in front of the body and cause increase of lumbar lordosis, which in turn causes fatigue in the paravertebral muscles. When body weight increases, the spine will be compressed to accept this burdensome load, resulting in mechanical stress on the lower back. Mechanical stress that occurs for a long time can cause complaints of low back pain. Finding of this research stated that no relationship of BMI and complaint of LBP, it means that BMI is not a main factor of complaint of dental therapist in Pati Indonesia. A research with similar finding done at Pontianak, which found that no relationship of BMI and nurse hwootk at hospital and their complaint of LBP.¹⁸

The type of work determines the static body position at work. Workers whose work positions are not ergonomic are more likely to experience lower back pain than workers whose work positions are ergonomic. A work position which is not ergonomic will eventually cause complaints of low back pain. This work position causes a heavy postural load. If this postural load occurs for a long time, it will cause a postural strain which is a static mechanical load on the muscles. This condition will reduce blood flow to the muscles so that there is a chemical balance disorder in the muscles which leads to muscle fatigue. Static work postures include minimal movement, limited posture, and inactivity that causes a static load on the muscles. Dentists are the profession which has high risk relate with

ergonomic position of working.¹⁹ Dental therapist also has risk for incidence of LBP when they work not focus on ergonomic position. A research also found a relationship of length of work and work position with complaint of LBP at the brick press industry in Pejaten village, Tabanandistrict, Bali Indonesia.²⁰

5. CONCLUSIONS:

- 4.1. There is no relationship of age, gender and body mass index (BMI) with complaint of LBP of dental therapist in Pati, Indonesia
- 4.2. There is a relationship of length of work and working position are as risk

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