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Analysis Of Factors Associated With Low Back Pain In Dentists In Jambi City

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Abstract

Low back pain (LBP) is a common complaint experienced by workers in various sectors including dentists. LBP can cause limited physical activity and decreased productivity and quality of work. The purpose of this study was to analyse the factors associated with the incidence of low back pain in dentists. This research used a cross-sectional study design with a sample of 134 dentists selected by purposive sampling. Data were collected through a characteristic questionnaire, *Low Back Pain Disability (ODI)* Questionnaire, *Rappid Upper Limb Assessment (RULA)* observation sheet, then analysed using the chi- square test in SPSS version 26.0.The results showed that the variables of work posture, BMI and length of work were the most influential variables on the incidence of LBP. Respondents who have abnormal BMI have a risk of 10.65 times the incidence of NCD. Based on the results of the study it can be concluded that low back pain in dentists is related to work posture, BMI, and length of work.

Keywords: Low back pain (LBP); Dentist; Analysis

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1. Introduction

The International Labour Organisation (ILO) predicts that work accidents and occupational diseases cause around 2.8 million people to lose their lives every year. Based on the number of deaths, it is predicted that around 2.4 million or 86.3% of the

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deaths of workers are caused by occupational diseases and the remaining around 380,000 or 13.7% are caused by work accidents.1 In Indonesia, referring to the Old Age Security (JHT) fee data managed by BPJS Ketenagakerjaan in January 2020 there were 203 cases of death and total disability due to occupational diseases. Then, it increased in February 2020 to 403 cases of occupational diseases, until in March 2020 it reached an increase in cases to 603 cases of occupational diseases.2 Cases of death and disability due to occupational diseases continue to increase significantly every year.

Based on *Great Britain* data in 2017, it shows that *musculoskelatal disorder* (MSDs) is the second highest contributor to the high number of occupational diseases in the world.4 *Musculoskelatal disorder* (MSDs) complaints that are often complained of by almost all populations in the world are complaints of Low Back Pain (LBP). It is predicted that around 80 per cent of the world's population has experienced pain in the lower back or at least once in their lives.

Occupational low back pain is estimated to be the cause of 21.8 million lost years of life (DALYs) or up to 35% of lost years of life of the world's population.6 In the United States, it is predicted that about 149 million working days are lost due to NBP, resulting in losses ranging from US$100 to US$200 billion per year.7 In developing countries about 15-20% of the population experiences persistent low back pain.

Low back pain can be caused by many factors such as biopsychosocial (age, spinal conditions and congenital diseases, gender), ergonomic factors (workload, work posture, work duration, work repetition), and environmental factors (extreme temperatures, vibration, and noise). The theory of Marras et al (2006) states that individual factors that affect the incidence of low back pain consist of age, gender, body mass index (BMI), length of service, smoking habits, educational history, income level, history of physical activity.9 Bridger (2008) states that a history of trauma and illness due to the framework is also included in individual factors that affect NBP.10 Work factors that affect low back pain based on the theory of Armstrong and Chaffin (2009), namely workload, work posture, repetition and duration of work in certain positions. Furthermore, environmental factors, the environment can also affect the occurrence of low back pain in workers, the theory of Armstrong and Chaffin (2009) states

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environmental factors that affect low back pain in the form of vibration, noise, and extreme temperatures.

Dentists experience high physical and mental stress in daily practice, often in non-ergonomic positions while performing dental treatment, which can cause strain on the lower back muscles. Long working hours and high workloads increase the risk of low back pain, plus repetitive movements can damage spinal structures. Environmental exposures such as vibration and noise also affect the risk. Thus, the working conditions of dentists, including non-ergonomic postures, long work duration, high workload, and non-ideal working environment, all increase their risk of low back pain and occupational fatigue.12 The risk factors present in dentists tend to increase if the dentist is a general dentist who practices independently. In a solo practice environment, general dentists do not have many opportunities to share the workload with colleagues or obtain direct assistance in handling tasks that require lifting or position adjustments that require more than one person. In addition, they may tend to extend working hours or neglect adequate rest in an attempt to manage their practice, which in turn may increase strain on the lower back due to lack of adequate rest.

The physical wellbeing of medical practitioners, especially in the context of low back pain risk, is an often overlooked but important aspect. General dentists who run independent practices in particular require more attention in relation to this condition. Although many studies have examined low back pain in various occupational sectors, the lack of information related to risk factors specific to general dentists in independent practice remains unaddressed. Based on the urgency described earlier, the researcher formulated a research problem, namely **'what are the factors associated with low back pain in general dentists in Jambi City'.**

2. Methode

This research is a type of quantitative research with an observational research design with a *cross sectional* study approach that has the aim of analysing the relationship between the dependent variable and the independent variable.13 The research was conducted in Jambi City by involving general dentists practicing independently in Jambi City. The population in this study was 134 dentists. Sampling in this study used purposive

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sampling technique. Data collection using observation and interview techniques, while the data used includes primary data. Data analysis using SPSS version 26.0 using the chi-square statistical test. In this study, the *chi-square* test was used to determine the risk factors for low back pain.

3. Result And Discussion

Based on research that has been carried out in July-October 2024, the following results are obtained:

Table 1
Characteristics of respondents (n=134)

	Variabel	n	%
LBP	Yes	120	89,6
	No	14	10,4
Age	at risk □ 35 years	73	54,5
	Not at risk < 35 years	61	45,5
Gender	Woman	117	87,3
	Man	12,7	12,7
Histori of disease	Yes	5	3,7
	No	129	96,3
Stress	Medium	67	50,0
	low	67	50,0
Work Postures	At risk	132	98,5
	No at risk	2	1,5
BMI	Not normal	66	49,3
	Normal	68	50,7
Job Duration	Old (□ 5 year)	90	67,2
	New (<5 year)	44	32,8
Length of work	At risk(□8 hours)	123	91,8
	Not at risk (<8 hours)	11	8,2
Repitition	At risk (□11 kali)	133	99,3
	Not at risk (<11 kali)	1	,7
Total		102	100,0

Source: *Primary Data Processed, 2024*

Based on table 1, it can be seen that the highest proportion of NPD status in the yes category is 89.6%, the highest age in the risk category ≥35 years is 54.5%, the highest proportion of female gender is 87.3%, the proportion of respondents who do not have a history of disease is higher than respondents who have a history of disease, 96.3%. The proportion of respondents who had moderate and mild stress levels was equal at 50%,

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many respondents had risky work postures at 98.5%. The proportion of normal BMI in respondents is greater than abnormal BMI, namely 50.7%, the working period of more than five years has the highest proportion of 67.2%. Respondents who had a working time of more than 8 hours had a higher proportion than respondents who had a working time of less than 8 hours, namely 91.8%. The proportion of repetitions more than 11 times was higher at 99.3%.

Tabel 2
Hasil Analisis factor-faktor yang berhubungan dengan nyeri punggung bawah pada dokter gigi di kota jambi

Variabel	NPB				Total	PR	(95% CI)	P-Value
	Ya		Tidak					
	n	%	n	%				
Usia								
Berisiko	68	93,2%	5	6,8%	73	2,35	0,74 – 7,44	0,228
Tidak Berisiko	52	85,2%	9	14,8%	61			
Jenis Kelamin								
Perempuan	105	89,7%	12	10,3%	117	1,16	0,23-5,73	0,692
Laki-Laki	15	88,2%	2	11,8%	17			
IMT								
Tidak Normal	53	80,3%	13	19,7%	66	0,61	0,00-0,48	0,002
Normal	67	98,5%	1	1,5%	68			
Riwayat Penyakit								
Ada	4	80,0%	1	20,0%	5	0,44	0,04- 4,31	0,429
Tidak Ada	116	89,9%	13	10,1%	129			
Stress								
Sedang	60	89,6%	7	10,4%	67	1,00	0,33-3,02	1,000
Ringan	60	89,6%	7	10,4%	67			
Beban Kerja								
Berat	1	50,0%	1	50,0%	2	0,10	0,00-1,85	0,199
Ringan	119	90,2%	13	9,8%	132			
Masa Kerja								
Lama	80	88,9%	10	11,1%	90	0,80	0,23 – 2,71	1,000
Baru	40	90,9%	4	9,1%	44			

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Lama Kerja Berisiko (>8jam) Tidak berisiko (<= 8 jam)	114 6	92,7% 54,5%	9 5	7,3% 45,5%	123 11	10,55	2,69 - 41,42	0,002
Repitisi >11 kali <= 11 kali	120 0	90,2% 0,0%	13 1	9,8% 100,0%	2 1	1,07	0,93-1,24	0,104
Postur Kerja Berisiko Tidak Berisiko	119 1	90,2% 50,0%	13 1	9,8% 50,0%	132 2	9,15	0,54-155,16	0,199
Total	**120**	**14**	**134**					

Sumber: *Data Primer Terolah, 2024*

Based on Table 2, it can be seen that in the age variable, the high proportion of NPD is at risk age or ≥ 35 years (93.2%%) compared to non-risk age or < 35 years. The results of bivariate analysis showed that there was no significant relationship between age and NHS status with a *p-value* of 0.228 (PR 2.35 95%CI 0.74 - 7.44). In gender, the proportion of respondents who have NPD is greater in female gender (89.7%) compared to male gender (88.2%). Based on the chi square results, the pvalue of 0.692>0.05 means that there is no significant relationship between gender and the status of NPD (PR 1.16 95%CI 0.23-5.73). In the IMT variable, it can be seen that the incidence of NPD is greater in proportion to abnormal IMT (80.3%) compared to normal IMT. The statistical test results showed a p-value of 0.002, which means there is a significant relationship between BMI and the incidence of NPD (*p-value*<0.05). Abnormal BMI is protective against the incidence of NCD (PR 0.61 95%CI 0.00-0.48).

In the disease history variable, the proportion of respondents who had NCD was higher among respondents with no history of disease (89.9%%) compared to those with a history of disease. Statistical test results showed that there was no significant relationship between history of disease and the incidence of NCD (p-value 0.429 PR 0.44 95%CI 0.04-4.31). In the stress variable, respondents who had NPD were equally proportional to respondents who experienced moderate and mild stress (89.6%). Based on the results of

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bivariate analysis, it can be seen that there is no significant relationship between the level of stress and the incidence of NPD (p-value 1.000 PR 1.00 95%CI 0.33- 3.02).

In the workload variable, the proportion of respondents who experienced NPD was high in light workload (90.2%%) compared to heavy workload. The*p-value* is 0.199, which means that there is no relationship between the weight of the load and the incidence of NPD. (PR 0.10 95%CI 0.00-1.85).In the working period variable, respondents who had NPD had the largest proportion in the new category, namely <=5 years (90.9%%) compared to the old > 5 years. Based on the results of bivariate analysis, it can be seen that there is no relationship between working period and NPD status (*p-value* 1.000 PR 0.80 95%CI 0.23 - 2.71).

In the variable of length of work, the proportion of respondents who experienced NBP was greater for respondents who had a length of work >8 hours (92.7%%) compared to respondents who had a length of work <=8 hours. Based on the p-value, it can be seen that there is a significant relationship between length of work and the incidence of NPD (*p-value* 0.002 <0.05). Respondents who had a work duration of > 8 hours a day had a 10.55 times risk of NPD (PR 10.55 95%CI 2.69 - 41.42). In the repetition variable, respondents who experienced NPD had a large proportion of respondents who did work repetitions > 11 times (90.2%) compared to respondents who did work repetitions <= 11 times. P value showed 0.104, which means there is no significant relationship between work repetition and the incidence of NPD (PR 1.07 95%CI 0.93-1.24).

In the work posture variable, the incidence of NPD was high in the risky work posture (90.2%%) compared to the non-risky work posture. The results of the analysis showed that there was no significant relationship between work posture and the incidence of NCD (p-value 0.199 PR 9.15 95% CI 0.54-155.16).

4. Conclusions

From the results and discussion it can be concluded that the factors associated with low back pain in dentists in Jambi city include: work posture, BMI, and tenure. And the dominant one is BMI. It is hoped that dentists maintain their ideal body weight and reduce the risk of body postures that can cause LBP and stretch before doing activities or after sitting for a long time working on patients.

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Reference

1. International Labor Organization. Meningkatkan Keselamatan dan Kesehatan Pekerja Muda. Kantor Perburuhan Internasional, CH- 1211 Geneva 22, Switzerland. 2018.
2. BPJS Ketenagakerjaan. Data Pencairan jaminan Hari Tua (JHT) BPJS Ketenagakerjaan. Jakarta; 2020.
3. Rini WNE, Aswin B. Analisis dan Prediksi Tren Kecelakaan Kerja Karyawan serta pengambilan kebijakan peserta BPJS Ketenagakerjaan Cabang Jambi. JMJ. 2021Apr.1 9(1);62-8.
4. LFS. Self-Reported Work-Related ill Health and Workplace Injuries. 2017.
5. Willia Novita Eka Rini, Budi Aswin, Fajrina Hidayati, Risk Factors for Low Back Pain Among Rubber Factory Workers. FJMR. 2023 Dec. 4;2(11):1815-26.
6. Rahayu SY, Rina Dayanti. Faktor-Faktor yang Berhubungan dengan Keluhan Low Back Pain Pada Mahasiswa Sarjana Keperawatan Non Reguler. Jurnal Sehat Masada. 2021;XV:371–9.
7. Gobbo S, Bullo V, Bergamo M, Duregon F, Vendramin B, Battista F, et al. Physical Exercise is Confirmed to Reduce *Low Back Pain* Symptoms in Office Workers: A Systematic Review of the Evidence to Improve Best Practices in the Workplace. Journal Funct Morphol Kinesiol. 2019 Jul 5;4(3).
8. Sifai IA, Lestantyo D, Jayanti S. Faktor-Faktor Yang Berhubungan dengan Keluhan Low Back Pain Pada Sopir IKAS (Ikatan Angkutan Sekolah) di Kabupaten Semarang. Jurnal Kesehatan Masyarakat. 2018;6(5):555–62.
9. World Health Organization. Priority Medicine for Eropa and the World " A Public Health Approach to Innovation, 2013.
10. Anggrika P. Hubungan Posisi Duduk Dengan Kejadian Low Back Pain Pada Pegawai Stikes. Jurnal Aisyiyah Medika. 2019;4(1).
11. Marras, William S KW. Fundamentals and Assessment Tools for Occupational Ergonomics. USA: CRC Press; 2006.
12. Rini WNE, Lanita U. Analysis of the risk factors of work fatigue in formal and informal workers. JMJ. 2023Jul.31;11(3):257-66.
13. RS B. Introduction to Ergonomics International Edition. Singapore: McGrawHill Book Co; 2008.

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International Journal of Health Sciences (IJHS)
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Volume 3 | Number 2 | June 2025 |

14. Armstrong, Chaffin. Elements of Ergonomics Programs a Primer Based on Workplace Evaluations of Musculoskeletal Disorders. US Departement of Health and Human Service NIOSH. Amerika; 2009. 121–162.
15. Refrestaningrum, Edwindi, Indriati Paskarini. Analisa Sikap Kerja Dokter Gigi yang Berhubungan dengan Keluhan Nyeri Pinggang di Rumah Sakit Surabaya.
16. Hardani, Auliya NH, Andriani H, Fardani RA, Ustiawaty J, Utami EF, et al. Metode Penelitian Kualitatif dan Kuantitatif. 1st ed. Husnu Abadi, A.Md. A, editor. Yogyakarta: CV. Pustaka Ilmu Group Yogyakarta; 2020. 245 p.
17. Heryana A. Jumlah kelompok Fungsi Syarat data. Univ Esa Unggul. 2020;(May):1–20.