

Differences in Stress Levels Due to Dental Pain based on Age Group in the Working Area of Jelbuk Jember Health Center

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ABSTRACT

Background: Stress caused by dental pain is a common but overlooked issue affecting all age groups. The health profile of Jember Regency in 2023 recorded that there were 94,439 cases of dental problems occurred in Jember Regency, with Jelbuk District ranking third in caries prevalence. This is exacerbated by the low number of visits to dentists in Jelbuk District, resulting in toothaches not being treated immediately, which can cause serious problems in the form of stress.

Purpose: This study was conducted to determine differences in stress levels due to dental pain based on age groups in the working area of Jelbuk Jember Health Center.

Methods: The methodology used in this study was observational analytic with a cross-sectional approach involving 120 people consisting of children, adolescents, adults, and the elderly selected through a purposive sampling technique. Variables in this study were stress levels due to dental pain and age. Data were analyzed using IBM SPSS Statistics version 31.0 with Kruskal–Wallis and Mann Whitney test.

Results: The results showed that subjects who experienced more mild stress were children (86.7%) and adolescents (66.7%), then subjects who experienced more moderate stress were adults (46.7%), and subjects who experienced more severe stress were elderly (36.7%). Analysis of the data obtained shows P-Value=0,000, meaning that there are differences in stress levels due to dental pain between age groups.

Conclusion: In conclusion, children with adults, children with the elderly, adolescents with the elderly, and adults with the elderly show differences in stress levels due to dental pain, while children with adolescents and adolescents with adults do not show any differences in stress levels due to dental pain.

Keywords: Age group, Dental pain, Stress level

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BACKGROUND

The prevalence or incidence of dental pain in Indonesia varies by region. The Indonesian Health Survey in 2023 recorded that 56.9% of Indonesians experienced oral health problems. The prevalence of oral health problems in East Java Province was 75.6%, with dental caries problems reaching 38.6% (Ministry of Health of the Republic of Indonesia, 2024). The health profile of Jember Regency in 2023 recorded that there were 94,439 cases of dental problems that occurred in Jember Regency (Health Office, 2024). The main problem of oral health in Indonesia and globally to date is dental caries (Borg-Bartolo et al., 2022). Dental caries is the main cause of dental pain or toothache in sufferers. Dental pain is defined as pain originating from the teeth or their supporting tissues as a result of an ongoing disease or injury to the teeth (Hariyani et al., 2024).

The pain that arises, especially in conditions of dental caries that are not properly treated, such as superficial dental caries, will cause expansion to deeper anatomical structures, which in turn can have a broad impact on oral and dental health and a decrease in general health (Arifin et al., 2024). Unhealthy oral health conditions can result in limited functions in the body and a decrease in quality of life, causing pain, decreased appetite, poor sleep, and decreased work and study activities (Amran et al., 2023).

Stress caused by dental pain is a common but rarely noticed problem. Stress can affect not only adults but also all groups with different levels of stress. (Mubin et al., 2024) categorized stress levels into several categories based on their intensity, ranging from mild to more severe. Mild stress often occurs in everyday life and can be overcome easily. Moderate stress arises when there are greater pressures or demands in life. Moderate stress can affect a person's physical and mental health if not properly addressed. Severe stress is an intense and prolonged level of stress. Severe stress is caused by traumatic events, significant losses, protracted conflicts, or conditions that are emotionally or physically overwhelming. Severe stress can have a serious impact on a person's mental and physical health and requires specialized attention and professional help.

Research on differences in stress levels with age is still rarely studied, so researchers want to know the differences in stress levels with age using the 10-item Perceived Stress Scale questionnaire or PSS-10. PSS-10 is the most widely used psychological instrument to measure standardized stress perception and has high validity and reliability (Harris et al., 2023). The PSS-10 can be used in all age groups because each question is easy to understand, and the response alternatives are easy to understand and general (Purnami & Sawitri, 2019). A person experiencing stress will assess one or more stimuli they receive from daily life as a danger, threat, or challenge. Stimuli that can cause stress, both external and internal, are called stressors (Handoko, 2022). Stressors that approach individuals will be perceived and will be interpreted differently from one individual to another so that the resulting response is different. The process of perceiving and interpreting this stressor involves mental processes (cognition) and individual experiences in life (Zahroh et al., 2020). The process explicitly explains that age differences will affect individual perceptions and meanings of stress.

Age is closely related to stress because the body's ability to fight disease in childhood is higher and decreases in old age, making it more susceptible to stress (Chouker, 2020). The meaning of the seriousness of pain for individuals also depends on one's age. Children have a limited understanding of disease and death, so the assessment of stress arising from dental pain is only focused on the present rather than paying attention to the impact of the pain in the future, while the assessment of stress through pain in someone entering adolescence, adulthood to the elderly characteristically concerns present difficulties and pays attention to the future such as possible risks that will occur so that stress in the age interval is high (Alkanan et al., 2023).

This statement is in line with research conducted by Zapater-Fajari et al., (2021), the older a person is, the more prone to stress, while someone prone to stress is at the age of 21-40 years and the age of 40-60 years.

Jelbuk Subdistrict is part of Jember Regency, which is located $\pm$ 12 km from the center of the Jember Government, with the population of Jelbuk Subdistrict based on age groups varying in each region (Central Bureau of Statistics of Jember Regency, 2024). Each age group in Jelbuk Sub-district is known to not get an equal education due to the location of the region and the location of schools far from the city, so awareness of continuing education is less because of the lack of access to information in areas far from the city (Central Bureau of Statistics of Jember Regency, 2024). In an interview conducted with dentist Sari at the Jelbuk Community Health Center, she mentioned that the level of education in the Jelbuk community was low and was reinforced by BPS data, namely 34.2% of the population had not or did not go to school, and 19.7% did not finish elementary school (Central Bureau of Statistics of Jember Regency, 2024). The low level of education causes most Jelbuk people to neglect their oral health. The Jember Health Office's UKP Health Center Report 2020 reported that Jelbuk District is one of the areas with the highest caries prevalence and ranks third in Jember Regency in caries cases (Kiswaluyo et al., 2022). Doctor Sari, in her interview, also mentioned that only 5% of the Jelbuk community wanted to check their oral health. The health profile data set by the Jember District Health Office in 2024 recorded that the number of visits to dentists in Jelbuk District in 2023 was low at 1.77% (Department of Health, 2024). Low visits to the dental clinic resulted in dental pain not being treated immediately, causing serious problems in the form of stress. Stress that occurs has different levels, so the author wants to examine the differences in stress levels due to dental pain based on age groups in the Jelbuk Jember Health Center working area.

Research related to the impact of dental pain generally focuses on pain, anxiety, and quality of life, while differences in stress levels due to dental pain based on age remain understudied. This study provides empirical evidence regarding differences in stress levels due to dental pain based on age in the community, which can provide insight into variations in psychological responses to dental pain based on age.

OBJECTIVE

This study was conducted to analyze differences in stress levels due to dental pain based on age groups in the working area of Jelbuk Jember Health Center.

METHODS

Research Design

The type of research used is analytical observational research with a cross-sectional approach method to determine differences in stress levels due to dental pain based on age groups in the working area of the Jelbuk Jember Health Center from July to August 2024.

Population and Sample

The study population was the community in the working area of Puskesmas Jelbuk Jember consisting of children aged 5-9 years, adolescents aged 10-18 years, adults aged 19-59 years, and elderly aged >60 years. The sampling technique in this study used purposive sampling. Respondent had specific characteristics that aligned with the objectives of the study, and not all members of the target population met the eligibility criteria. The sample size was calculated using the Slovin formula :

$$n = \frac{31.346}{1 + N(e)^2}$$

The resulting sample size was 120 participants divided into 30 research subjects in each age

group. The research subjects were selected according to the inclusion criteria, namely, respondents who were children accompanied by parents, adolescents, adults, and the elderly, respondents who had experienced dental pain due to dental caries and were able to communicate and fill out the questionnaire correctly and cooperatively. Information related to toothache was obtained from researchers' interviews with respondents, for toddler respondents they were assisted by their parents. The exclusion criteria used in this study were children with special needs, respondents, or parents of respondents who were illiterate and could not cooperate during the study. Variables in this study were stress levels due to dental pain and age. Stress levels due to dental pain was measured using the PSS-10 questionnaire and age was measured using respondent identification form.

Data Collection

The tools that will be used in this study are mouth glass, informed consent, and a 10-question questionnaire called the 10-item Perceived Stress Scale or PSS-10 to collect data from respondents. PSS-10 is a standardized questionnaire that has a high level of validity and reliability. The PSS-10 questionnaire was developed by Sheldon Cohen to measure the level of perceived stress felt by a person in everyday life (Harris et al., 2023). PSS-10 has five answers that are closest to individual feelings towards each question, namely score 0 never, score 1 rarely, score 2 sometimes, score 3 often, and score 4 very often. The total score obtained will determine the level of stress. The total score of the PSS scale ranges from 0 to 40, with higher scores indicating higher levels of perceived stress. The score assessment criteria are a score of 0-13 for mild stress levels, a score of 14-26 for moderate stress levels, and 27-40 for severe stress levels (Schneider et al., 2020). The results of each individual must be different even though they face the same situation. It all depends on how they can control and respond to stress, the total PSS-10 score can be at a low level or a high level (Suchecky et al., 2021).

Processing and Data Analysis

Before data collection is carried out, the instrument must first be tested for validity and reliability. Validity testing was carried out on 20 respondents in Summersari District Jember Regency. The processing used data processing software to find out whether each question item is valid or invalid with the conditions if r count is greater than r table and the value is positive then the item or question or indicator is declared valid. The validity test can also be seen from the level of significance, if it shows significant results, which are less than 0.05, it can be concluded that the questionnaire indicators are valid (Ranganathan et al., 2024).

The validity test for the PSS-10 questionnaire in this study shows significant results, which are less than 0.05 for each question in the questionnaire, so it can be concluded that the question indicators in the PSS-10 questionnaire used in this study are valid.

Data were analyzed using the Kruskal-Wallis test through the SPSS application program. The Kruskal-Wallis test is a non-parametric test used to test whether there is a statistically significant difference between two or more mutually independent sample groups on an ordinal scale dependent variable (Rozi & Maulidiya, 2022).

This study was approved by the Ethical Committee of Medical Research. Faculty of Dentistry University of Jember No. 2664/UN25.8/KEPK/DL/2024.

RESULTS

Characteristics, caries, and stress levels by age group, gender, and caries

The research conducted is an analytical observational study that aims to determine differences in stress levels due to dental pain based on age groups in the working area of the Jelbuk Jember Health Center from July to August 2024. Researchers selected research subjects using a purposive sampling method in the community in the working area of Jelbuk Jember Health Center by observing the inclusion and exclusion criteria. The research subjects used

were 120 people consisting of children, adolescents, adults, and the elderly. The research subjects who had been selected according to the inclusion and exclusion criteria next filled out the 10-item Perceived Stress Scale or PSS-10 questionnaire and a brief examination of the oral cavity was carried out along with interviews related to a dental pain that had been experienced. The results of the study are presented in tabular form.

Table 1. Frequency distribution of respondents' characteristics in the working area of Jelbuk Jember Health Center

Gender	Age Group								Total n (%)
	Child		Adolescent		Adult		Elderly		
	n	%	n	%	n	%	n	%	
Male	12	10%	10	8,3%	3	2,5%	6	5%	31 (25,8%)
Female	18	15%	20	16,7%	27	22,5%	24	20%	89 (74,2%)
Total	30	25%	30	25%	30	25%	30	25%	120 (100%)

Based on Table 1, it is known that of the 120 people who became research subjects, there were 30 subjects (25%) aged children 5-9 years, 30 subjects (25%) aged adolescents 10-18 years, 30 subjects (25%) aged adults 19-59 years, and 30 subjects (25%) aged elderly > 60 years who participated in the study. In gender characteristics, it is known that there are 31 subjects (25.8%) who are male and 89 subjects (74.2%) who are female. The data shows that the most common subject is female.

Table 2. Frequency distribution of caries in the working area of Jelbuk Jember Health Center

Caries	Frequency (n)	Percentage (%)
Superficial Caries	50	41,7
Media Caries	15	12,5
Profunda Caries	55	45,8
Total	120	100

Based on Table 2, it is known that out of 120 people who became research subjects, there were 50 subjects (41.7%) experienced superficial caries, 15 subjects (12.5%) experienced media caries, and 55 subjects (45.8%) experienced profunda caries. The data shows that the most common dental caries experienced by the subjects is profunda caries.

Table 3. Frequency distribution of stress levels in the working area of Jelbuk Jember Health Center

Stress Levels	Frequency (n)	Percentage (%)
Mild	68	56,7
Moderate	37	30,8
Severe	15	12,5
Total	120	100

Based on Table 3, it is known that of the 120 people who became research subjects, 68 subjects (56.7%) experienced mild stress, 37 subjects (30.8%) experienced moderate stress, and 15 subjects (12.5%) experienced severe stress. The data shows that the most experienced

level of stress is mild stress.

Different levels of stress occur in each age group of subjects who experience dental pain in the working area of the Jelbuk Jember Health Center. The results of the study regarding the distribution of stress levels due to dental pain by age group are presented in Table 4.

Table 4. Distribution of stress levels due to dental pain in the working area of Jelbuk Jember Health Center based on age group

Age Group	Stress Levels						Total n (%)
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
Child (5-9)	26	21,7%	4	3,3%	0	0	30 (25%)
Adolescent (10-18)	20	16,7%	10	8,3%	0	0	30 (25%)
Adult (19-59)	12	10%	14	11,7%	4	3,3%	30 (25%)
Elderly (>60)	10	8,3%	9	7,5%	11	9,2%	30 (25%)
Total	68	56,7%	37	30,8%	15	12,5%	120 (100%)

The histogram graph regarding the distribution data of stress levels due to dental pain based on age groups can be seen in Figure 1.

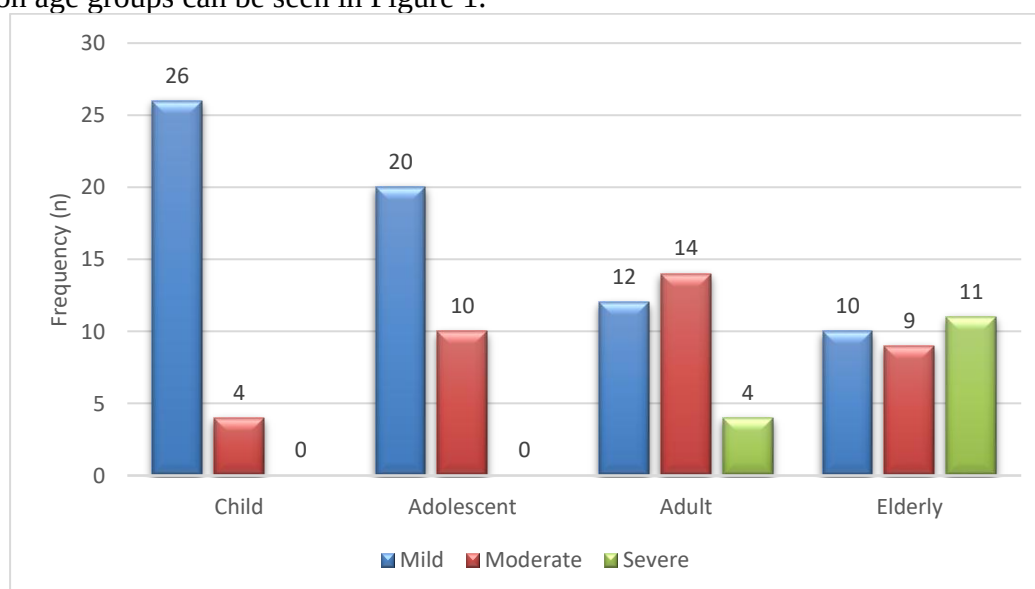


Figure 1. Distribution of Stress Levels Due to Dental Pain in the Working Area of the Jelbuk Jember Health Center Based on Age Group

Based on the distribution of stress levels by age group in subjects who have experienced dental pain in the last few weeks in Table 4 and Figure 1, it is known that subjects with children aged 5-9 years as many as 26 subjects (86.7%) tend to experience mild stress, 4 subjects (13.3%) experience moderate stress, and no children experience severe stress. In the adolescent age group 10-18 years, 20 subjects (66.7%) also tended to experience mild stress, 10 subjects (33.3%) experienced moderate stress, and no adolescents experienced severe stress. In the adult age group 19-59 years, 12 subjects (40%) experienced mild stress, 14 subjects (46.7%) tended to experience moderate stress, and 4 subjects (13.3%) experienced severe stress. In the elderly age group >60 years, 10 subjects (33.3%) experienced mild stress, 9 subjects (30%) experienced moderate stress, and 11 subjects (36.7%) tended to experience severe stress. The data shows that subjects who experience more mild stress are children and adolescents, then

subjects who experience more moderate stress are adults, and subjects who experience more severe stress are elderly.

Table 5. Distribution of stress levels due to dental pain in the working area of Jelbuk Jember Health Center based on gender and dental caries

Gender	Caries	Stress Levels						Total n (%)
		Mild		Moderate		Severe		
		n	%	n	%	n	%	
Male	Superficial Caries	16	13,3%	0	0	0	0	16 (13,3%)
	Media Caries	0	0	0	0	0	0	0 (0%)
	Profunda Caries	6	5%	7	5,8%	2	1,7%	15 (12,5%)
Female	Superficial Caries	34	28,4%	0	0	0	0	34 (28,4%)
	Media Caries	10	8,4%	5	4,2%	0	0	15 (12,6%)
	Profunda Caries	2	1,6%	25	20,8%	13	10,8%	40 (33,2%)
Total		68	56,7%	37	30,8%	15	12,5%	120 (100%)

The histogram graph regarding the distribution data of stress levels due to dental pain based on gender and dental caries can be seen in Figure 2.

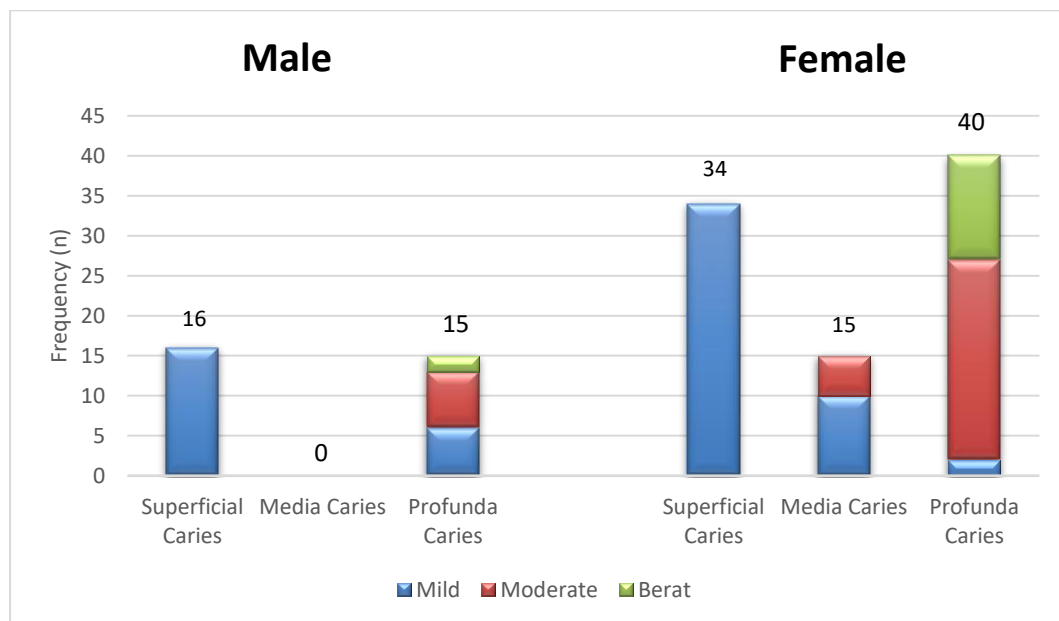


Figure 2. Distribution of Stress Levels Due to Dental Pain in the Working Area of Jelbuk Jember Health Center Based on Gender and Dental Caries

The distribution of stress levels based on gender and dental caries in Table 5 and Figure 2 shows that male subjects who experience superficial caries are 16 subjects (100%) experiencing mild stress. In men who experienced profunda caries, there were 6 subjects (40%) experiencing mild stress, 7 subjects (46.7%) experiencing moderate stress, and 2 subjects (13.3%) experiencing severe stress. In the female gender who experienced superficial caries, 34 subjects (100%) tended to experience mild stress. In women who experienced media caries, there were 10 subjects (66.7%) experiencing mild stress and 5 subjects experiencing moderate stress, while women who experienced profunda caries were 2 subjects (33.3%) experiencing

mild stress, 25 subjects (62.5%) experiencing moderate stress and 13 subjects (32.5%) experiencing severe stress. From these data, it shows that most of the subjects who experience dental pain are female, with the most experienced dental caries being profunda caries in the category of stress levels that are most often felt as mild stress.

Data Analysis

The normality test is a statistical test used to check whether the research data is normally distributed or not. The normality test will look at the probability value of the Shapiro-Wilk normality test to determine the normality of the data. At a significant level of 5%, if the p-value > 0.05 , it means that the data is normally distributed, while if the p-value < 0.05 , it means that the data is not normally distributed (Kurniawan et al., 2024). The following are the results of the normality test that has been carried out using SPSS.

Table 6. The results of the normality test of the data score of stress levels due to dental pain in the Jelbuk Jember Health Center work area based on age group

Variable		p-value	Description
Stress Level Score Due to Dental Pain	Child (5-9)	0,171*	Normal
	Adolescent (10-18)	0,205*	Normal
	Adult (19-59)	0,078*	Normal
	Elderly (>60)	0,035	Not Normal

Based on Table 6, the results of the normality test of the data on the stress level score due to dental pain based on age group have a p-value < 0.05 , so it can be concluded that the data is not normally distributed, so it requires a non-parametric test. The non-parametric test used to test whether there is a statistically significant difference between variables is the Kruskal-Wallis test. The significance value of Asymp. Sig. < 0.05 , it means that there is a significant difference, while if Asymp. Sig. > 0.05 , which means there is no significant difference. The results of the Kruskal-Wallis test are presented in the form of a table below.

Table 7. Kruskal-Wallis test results for differences in stress levels due to dental pain based on age groups in the Jelbuk Jember Health Center working area.

Stress Levels	
Kruskal-Wallis H	16.256
Asymp. Sig.	0,000*

Based on table 7, it is known that the results of the Kruskal-Wallis test show a significance value = 0.000, it can be concluded that Asymp. Sig. < 0.05 , which means that there is a significant difference in the level of stress due to dental pain based on age group in the working area of Jelbuk Jember Health Center, so further tests are needed. The further test used to determine whether or not there is a difference between two groups compared to unequal respondents (2 different groups) is the Mann-Whitney test (Hulu & Kurniawan, 2021). The significance value of Asymp. Sig. < 0.05 , it means that there is a significant difference, while if Asymp. Sig. > 0.05 , then it means there is no significant difference. The results of the Mann-Whitney test are presented in the form of a table below.

Table 8. Mann Whitney test results for differences in stress levels due to dental pain based on age groups in the Jelbuk Jember Health Center working area.

		Asymp. Sig.	Description
Stress Level Score Due to Dental Pain	Child with Adolescent	0,143	No Difference
	Child with Adult	0,014*	There is a difference
	Child with Elderly	0,000*	There is a difference
	Adolescent with Adult	0,446	No Difference
	Adolescent with Elderly	0,006*	There is a difference
	Adult with Elderly	0,033*	There is a difference

Based on Table 8, it is known that the results of the Mann-Whitney test show the significant value of children with adolescents and adolescents with adults, namely Asymp. Sig. > 0.05 , which means that there is no significant difference in stress levels in children with adolescents and adolescents with adults. Meanwhile, children with adults, children with the elderly, adolescents with the elderly, and adults with the elderly show a significant value of Asymp. Sig. < 0.05 , which means that there are significant differences in stress levels in children with adults, children with elderly, adolescents with elderly, and adults with elderly.

DISCUSSION

Stress caused by dental pain is a common but rarely noticed problem. Stress can affect not only adults but also all groups with different levels of stress. The difference that occurs is because stressors that approach individuals will be perceived and interpreted differently from one individual to another, so the resulting response is different. The frequency distribution of respondent characteristics in Table 1 shows that all 120 research subjects, consisting of children, adolescents, adults, and the elderly, participated in the study. The participation of each age group was carried out to find out the differences in stress levels in each age group of a person. The selection of age groups in this study is based on the relationship between age groups and stress due to dental pain, which can cause psychological disorders if left unchecked (Hariyani et al., 2024). The gender characteristics show that the gender of most subjects is female. These results are due to the number of female population in Jelbuk District being more than male (Central Bureau of Statistics of Jember Regency, 2024). At the time of the study, most of those who brought children to the Integrated Services Post were mothers, and when doing door-to-door, most of those who were in the house were women because men were working. The majority of girls in the Jelbuk sub-district also tend to prefer playing inside the house, while boys prefer playing outside the house, such as soccer.

The frequency distribution based on dental caries in Table 2 shows that the most dental caries experienced by the subjects is profunda caries. These results follow the Jember Health Office's UKP Puskesmas Report 2020, which reports that Jelbuk District is one of the areas with the highest prevalence of caries and ranks third in Jember Regency in caries cases (Kiswaluyo et al., 2022). The dental caries that were found in this study were profunda caries. The high prevalence of profunda caries is due to the low level of education of the Jelbuk community, so there is a lack of information or education regarding proper dental care (Department of Health, 2024). The low level of education causes tooth cleaning behavior, and public awareness of the importance of maintaining dental health is low and often ignored. The community only goes to the dentist when it feels very disturbing that the caries condition is deep until it leaves a thin layer of dentin and approaches the pulp chamber. The research results obtained are in line with Doctor Sari's statement in her interview, which stated that only 5% of the Jelbuk community wanted to check their oral health. This statement is also in line with the

health profile data set by the Jember Regency Health Office in 2024, which recorded that the number of visits to dentists in Jelbuk District in 2023 was low at 1.77% (Department of Health, 2024). Low visits to the dental clinic result in dental caries not being treated immediately, so caries can extend to the pulp and can be the biggest reason for stress in each age group in the Jelbuk Jember Health Center working area.

The frequency distribution based on stress levels in Table 3 shows that the most experienced stress level is mild stress. Based on the results of research conducted by Hariyani et al., (2024), it is known that some people in Indonesia experience dental pain due to caries with a mild stress level category of 63.95%, moderate stress of 27.02%, and severe stress of 9.03% (Hariyani et al., 2024). The data follows the results obtained in the Jelbuk community, where the majority often experience mild stress in their daily lives, namely 56.7%. Mild stress that occurs in the Jelbuk community can be overcome easily and usually does not have a significant impact, so stress due to dental pain due to caries can be handled with simple coping strategies. Simple coping strategies applied include relaxation techniques such as deep breathing, distraction such as sleep, social interaction, and good self-care such as adequate rest and eating healthy foods so that it can help in reducing the negative impact of stress (Mubin et al., 2024).

The results of the calculation of stress level scores based on age groups in subjects who have experienced dental pain in the last few weeks are shown in Table 4. The results obtained by subjects who experienced more mild stress were children aged 5-9 years, as many as 26 subjects (86.7%) and adolescents 10-18 years, as many as 20 subjects (66.7%) than subjects who experienced more moderate stress were adults aged 19-59 years as many as 14 subjects (46.7%), and subjects who experienced more severe stress were elderly age group >60 years as many as 11 subjects (36.7%). The difference in stress levels that occur in each age group of the Jelbuk community is because at a younger age, they tend not to feel stress when pain arises due to dental pain due to caries, so children and adolescents have mild stress levels compared to older ages. Adults and the elderly, in their interviews, stated that their productivity was more often disrupted when the pain caused by caries appeared, so the level of stress that occurred in the adult and elderly age intervals was higher. According to Chouker (2020), age is closely related to stress because the body's ability to fight disease in childhood is higher and decreases in old age, making it more vulnerable to stress. Research conducted by Zapater-Fajará et al., (2021) also suggests that the older a person is, the more vulnerable that person is to stress, while someone prone to moderate stress at the age of 21-40 years and severe stress at the age of 40-60 years. This statement follows the results of the research obtained, namely the tendency of the age groups of children and adolescents to experience only mild stress, while adults and the elderly experience higher stress, namely moderate to severe stress.

The results of the calculation of the stress level score based on gender and dental caries in Table 5 show that most of the subjects who experienced dental pain were female, with the most dental caries experienced profunda caries in the category of stress levels most often felt was mild stress. Previous research has also shown similar results, namely, the prevalence of profunda caries in female patients is greater than that of male patients. Women experience more dental caries because women's teeth erupt at an earlier age, so women's teeth are exposed to the cariogenic oral environment longer, women are also associated with hormonal factors, women have estrogen hormones that increase in the menstrual cycle and puberty. Women generally like to eat sweet and sugar-containing foods, so the incidence of caries is more prevalent in women than men (Elamin et al., 2021). Profunda caries, which occurs if left unchecked, can cause pain during meals and sudden pain without stimulation, which ultimately causes stress in a person. Mild stress in women who experience caries in this study is because most women do not worry about the pain that occurs so that stress can be easily overcome and

can still carry out daily activities due to the demands of home workers, especially mothers so that the pain that arises is often ignored.

The results of the normality test of the data score of stress levels due to dental pain based on age groups using the Shapiro-Wilk normality test in Table 6 showed that the data were not normally distributed. The results of the Kruskal-Wallis test in Table 7 show a significance value of 0.000; it can be concluded that the p-value <0.05 , which means that there are differences in stress levels due to dental pain based on age groups in the Jelbuk Jember Health Center working area. The results of further tests of differences in stress levels based on age groups using the Mann-Whitney test in Table 8 show that in the two age groups compared, namely between children and adolescents and adolescents and adults, there is no significant difference in stress levels. Adolescence is a period between childhood and adulthood, so in the adolescent age group, it is still emotionally, physically, and socially unstable sometimes, some adolescents still have a child's mindset, and some others have been able to think maturely and have stable emotions. Therefore, the level of stress arising from dental pain in children with adolescents and adolescents with adults is not different (Zahid et al., 2020). In the two age groups compared, namely between children and adults, children and the elderly, adolescents and the elderly, and adults and the elderly show significant differences in stress levels. The difference in stress levels that occurs is due to the age gap between each of the two age groups compared is quite different so the mindset, physical, and life burden are different from one another therefore, the results obtained have differences between the stress levels of children and adults, children and elderly, adolescents and elderly, and adults and elderly (Stefaniak et al., 2022).

The difference in stress levels due to dental pain due to caries that occur in children and adults compared in this study is due to various underlying factors. In terms of mindset regarding the perception of dental pain, children tend to think concretely so that the stress that arises from dental pain is only focused on the present rather than paying attention to possible future risks (Nakano et al., 2022). Stress due to dental pain that occurs at a child's age does not have too much impact on daily activities, as evidenced by children still being able to play and also being able to do school activities well. In the adult age group, the perception of dental pain does not only focus on the present but pays more attention to the risks that will occur in the future, such as complications or death (Alkanan et al., 2023). Thinking about the risks that will occur is due to a better understanding of the various diseases and medical conditions that can cause pain in adults, causing concern that the dental pain experienced is a sign of a serious illness, which ultimately triggers higher stress in this age group.

In terms of the burden of life between children and adults is different, so the level of stress is also different. The burden of life in children is relatively light because they generally have fewer responsibilities than adults (Lutin et al., 2023). Children tend to cope more easily with the stress caused by dental pain because children have more time for rest and recovery. Adults such as students or people who work have more responsibilities, so if pain such as dental pain arises, adults do not have enough time to recover, which ultimately exacerbates the dental pain. In general, adults who experience toothache are often unable to organize their activities, causing pressure called stress. The research of Matud et al., (2020) that adults tend to have higher stress levels due to the busy activities of college or work, so the level of fatigue in the adult age group is higher.

The level of stress due to dental pain that occurs in children with the elderly and adolescents with the elderly compared in this study is also different. The American Academy of Pediatric Dentistry (2024) suggests that the immune system of children and adolescents is generally more active and responsive to various kinds of infections, including infections that cause dental pain, namely caries. The bodies of children and adolescents will produce

antibodies more quickly to fight bacteria that cause infection so that the healing process tends to be faster so that the stress that arises does not last long and can be overcome immediately. The immune system in the elderly tends to weaken due to reduced antibody production, so the body is slower to respond to infections caused by dental caries (Wang et al., 2022). Severe caries in the elderly can cause significant tooth decay, hindering the ability of the elderly to chew food properly. Impaired chewing ability can lead to malnutrition, weight loss, and other digestive problems, resulting in increased stress in the elderly. Some elderly people are also known to have difficulty accessing dental care due to limited mobility. These limitations cause delays in caries treatment so that conditions worsen to disrupt the sleep patterns of the elderly. Prolonged sleep disturbance causes the body to become easily tired, which can have an impact on physical and mental health (Janto et al., 2022). This impact causes the elderly to become depressed at work and easily stressed. Research conducted by Zapater et al. (2021) also states that the older a person is, the physical condition and organ function also decrease, making them vulnerable to stress. Research conducted by Do & Moon (2020) said that the elderly age group experienced higher levels of stress due to the body's ability to fight disease decreasing so that oral discomfort, dental pain, and chewing discomfort often occurred in the elderly age group.

The adult age group and the elderly also have differences in stress levels due to dental pain. The level of stress that occurs in these age groups is equally high, although to different degrees. An adult, in general, has reached physical maturity. Adult age groups have good emotional stability and physical strength, especially in the face of pressure, so adults tend to have better pain tolerance. Stress that arises due to dental pain will be responded to in a non-excessive manner and can be managed well by adults reaching the stage of self-adjustment so that the stress experienced by the adult age group does not last long. Tolerance to pain, including dental pain due to caries in the elderly, has decreased due to physiological changes that occur in old age (Samosir, 2022). Stress that occurs in adults is only felt if it has disrupted activities at home, in the workplace environment, and social interactions in the social environment (Chu et al., 2024). Research conducted by Janto et al., (2022) suggests that as we age, tooth enamel becomes thinner so that the dentin underneath becomes more sensitive to hot, cold, or sweet foods that are exposed. Decreased production of saliva in the elderly can also increase the risk of tooth decay and make teeth more sensitive. Nerve changes in the elderly cause the pain that arises to be more sensitive. The changes that occur are shown by the elderly, who are more irritable, lose their appetite, and their health begins to decline due to the pain stimuli received so that the stress that occurs can last long and prolonged (Reynolds et al., 2022). The changes that occur are what cause the elderly age group to experience stress more easily with high intensity.

This study shows differences in stress levels due to toothache based on age group. These findings indicate that psychological responses to toothache are influenced not only by pain intensity but also by biological, psychological, and social characteristics that differ at each life stage. These findings are also supported by Hariyani et al. (2024) who, using Indonesian population data, showed that dental pain is associated with increased stress levels even after controlling for age, gender, education, economic status, and religiosity (OR = 1.31; 95% CI: 1.14–1.49). This suggests that toothache is an independent factor contributing to psychological stress (Hariyani et al., 2024). A study by Tsai et al. (2022) reported that in young adults, untreated dental caries is significantly associated with increased stress. Individuals with two or more carious teeth are approximately 3.6 times more likely to experience symptomatic mental stress than individuals with fewer carious teeth (Tsai et al., 2022).

Biologically, toothache is a consequence of the inflammatory process of the pulp and periapical tissue that activates trigeminal nociceptors. Pain stimuli are transmitted to the central nervous system via the trigeminal pathway, triggering activation of the hypothalamic-pituitary-

adrenal (HPA) axis and the sympathetic nervous system. This activation increases the secretion of cortisol and catecholamines, which are key mediators of the stress response. If pain persists, prolonged activation of the HPA axis can lead to increased stress perception, sleep disturbances, fatigue, and a decreased quality of life. Furthermore, inflammatory mediators such as interleukin-1 β , interleukin-6, and tumor necrosis factor- α , which are increased in pulp infections, are also known to play a role in modulating neuroimmune and psychological responses (Hensel et al., 2024).

From a psychological perspective, the experience of pain is influenced by both cognitive and emotional processes. Individuals experiencing toothache often develop anxiety regarding the underlying cause of the condition, fear of undergoing dental treatment, and concerns about disruptions to their daily activities. These factors may amplify pain perception through the mechanism of *pain catastrophizing*, a maladaptive cognitive response characterized by exaggerated negative thoughts and emotions toward pain. Heightened pain perception subsequently intensifies the stress response, resulting in a bidirectional relationship between dental pain and psychological stress. Age also appears to influence this mechanism. Young adults are generally exposed to greater academic, occupational, and social demands, making them more susceptible to elevated stress levels when experiencing toothache. In contrast, among older adults, the psychological impact of dental pain is more likely to be mediated by functional limitations, impaired chewing ability, reduced independence, and diminished oral health-related quality of life rather than by academic, occupational, or social pressures (Rahardian et al., 2024).

CONCLUSION

The conclusion of this study is that there are differences in stress levels due to dental pain based on age groups in the working area of the Jelbuk Jember Health Center. Differences in stress levels due to dental pain were found in the age groups of children with adults, children with the elderly, adolescents with the elderly, and adults with the elderly, while children with adolescents and adolescents with adults showed no difference. The highest level of stress due to dental pain occurred in the adult and elderly age groups, with the adult stress level category being moderate stress and the elderly being severe stress. Future research can be conducted using different research methods and different research areas.

CONFLICTS OF INTEREST

No conflict of interest.

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