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Research Report

The relationship between dental fear, anxiety and sociodemography in Jakarta, Indonesia

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ABSTRACT

Background: *The anxiety associated with dental visits is one of the obstacles preventing dentists from improving oral health and is also a significant predictor of dental visit evasion, which is frequently observed in Indonesia.* ***Purpose:*** *To identify the level of dental fear and anxiety in the population of Jakarta, Indonesia and establish the relationship with sociodemographic factors.* ***Methods:*** *A cross-sectional method was used with a sample size of 1811 respondents aged 17–65 years old who were asked to complete the validated Indonesian versions of modified dental anxiety scale (MDAS) and dental fear scale (DFS) questionnaires. The data obtained was then analysed using nonparametric and chi-square tests.* ***Results:*** *The prevalence of subjects with moderate to high dental anxiety and fear was 16.3% (295 respondents) and 36.1% (654 respondents), respectively. The primary sources of dental fear and anxiety were dental drilling and anaesthesia before tooth extraction. The results of the nonparametric and chi-square tests show that both are significantly related to gender, age, educational status, income level, insurance and history of dental visits (p = < 0.05).* ***Conclusion:*** *Several sociodemographic factors are associated with dental fears and anxiety among the participants in Jakarta, Indonesia.*

Keywords: *Dentist visit; dental fear and anxiety; sociodemography; Indonesia*

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INTRODUCTION

The fear of dental care is a major obstacle to preventing problems related to dental and oral health, which are known to interfere with daily activities. Dental fear is a challenge for dentists because it complicates medical procedures and leads to irregular dental visits (and ultimately poor oral health).[1–4] This type of fear, which can be defined as an emotional response to a threat or danger involving dental treatment, is a common phenomenon in dentistry.[5,6]

In Indonesia, a survey on dental fear and anxiety measured the prevalence of anxiety towards certain dental treatments: tooth extraction, dental fillings and oral hygiene; the results showed that around 20–30% of subjects felt fear and anxiety towards the treatments. There is limited data on the common causes of dental fear and anxiety in Indonesian society. However, research in other countries reports that the frequency of dental anxiety ranged from 5% to 20% and was higher in females.[7,8] Furthermore, the prevalence of dental anxiety among children ranged from 6% to 20%, and in adolescents, this increased to 11%.[6] The prevalence of dental anxiety varies from 4% to 30%.[9] The percentage of dental care utilisation in Jakarta province is only 16.4%;[10] therefore, it can be concluded that while Jakarta is the province with the fastest rate of progress and development in Indonesia, residents are less likely to participate in dental health care. The low number of dental visits or avoidance of dental treatment may both be a result of dental anxiety and fear.

Several instruments have been developed to measure anxiety and fear related to dental care. One of the most common instruments is the dental anxiety scale (DAS). The DAS is widely used and has been updated by Dailey et al.[11] to the modified dental anxiety scale (MDAS), which is more

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concise and is both valid and reliable.[6] It consists of five questions, with each question offering responses ranging from 1 to 5 ('not anxious' to 'very anxious', respectively). The minimum total score was 5 and the maximum was 25; 19 and above indicated high dental anxiety, which may require special attention from the dentist.[12]

The Kleinknecht's Dental Fear Scale is the second most frequently used instrument, and it focuses on specific situations and procedures.[13] The updated version contains 20 questions rated on a five-point scale where 1 is 'no fear' and five means 'extreme fear'; hence, the total scores ranged from 20 to 100.[14] The purpose of this study is to provide data on the prevalence of fear and anxiety levels associated with dental care in Indonesia – especially in the province of Jakarta – and identify the main causes of these and their relationship with sociodemography using the MDAS and DFS. Data on the prevalence of dental fear and anxiety is critical for Indonesian dentists and governments in order to see how much this will affect dental care and how to address this phenomenon.

MATERIALS AND METHODS

This study used an analytic cross-sectional design to determine the relationship between sociodemographic factors and the fear and anxiety levels towards dental care. The population included 17–65-year-old residents from the Thousand Islands and regions in the Jakarta province (Central, East, West, North and South Jakarta). The study was conducted from September to November 2017 following the review and approval of the research ethics protocol by the YARSI University Ethics Commission (certificate number 316/KEP-UY/BIA/XI/2017). The participants signed informed consent, and multistage cluster sampling was used: the sample was taken randomly up to the district level and in accordance with the proportion of the population of Jakarta with a total of 1811 respondents.

The procedure was conducted by requesting permission from the relevant agencies and testing the validity and reliability of the MDAS and DFS questionnaires (0.844 and 0.935, respectively) using Cronbach alpha and a p value of < 0.05. The calculated r value is greater than r table for all question items from the two questionnaires using the Pearson product moment correlation test. The DFS and MDAS scoring, which initially consisted of a five-point scale, was converted into two-point scale for analysis in logistic regression. The scores in MDAS are divided as follows: 0–5 for not anxious, 6–10 for somewhat anxious, 11–14 for moderately anxious, 15–18 for highly anxious and 19–25 for extremely anxious. For DFS, the scores are divided as š 60 for high dental fear, 34–59 for moderate fear, 21–33 for low fear and scores < 20 for no fear.

The surveys were first calibrated by six interviewers then administered by researchers and extended for approximately two months. Furthermore, each respondent was asked to provide sociodemographic data consisting of age, region, sex, education level, income, questions related to health insurance and history of dental visits. The Indonesian versions of the DFS and MDAS were made available. The subjects' ages were classified into 17–25, 26–35, 36–45, 46–55 and 56–65, and education level was divided into basic (elementary–junior high school), secondary (high school) and higher (higher education/university). Income level was categorised into non-income and income below and above the Jakarta UMR (regional minimum wage).[15] The data obtained was analysed using SPSS software with a nonparametric test to compare the medians because the data did not have a normal distribution or chi-square values for proportions and binary logistic regression.

RESULTS

Based on sociodemographic status, the frequency distribution of research respondents is shown in Table 1. The data in Table 1 shows a gender variable characterised by 1012 male respondents (55.9%) and 799 female respondents (44.1%). In the age variable, the largest proportion was in the group of 17–25-year-olds (818 respondents, 45.2%) while the smallest was 37 respondents (2%) in the 56–65 age group.

Table 1. Sociodemographic status of research subjects

Variable	N	%
Gender		
Male	1012	55.9
Female	799	44.1
Region		
North Jakarta	300	16.6
Central Jakarta	201	11.1
East Jakarta	414	22.9
West Jakarta	404	22.3
South Jakarta	382	21.1
Thousand Islands	110	6.1
Age of subject		
17–25 years old	818	45.2
26–35 years old	491	27.1
36–45 years old	273	15.1
46–55 years old	190	10.5
56–65 years old	37	2.0
Level of Education		
Higher Education	508	28.1
Secondary Education	921	50.9
Basic Education	381	21.0
Income		
No income	479	26.4
< Minimum wage	433	23.9
≥ Minimum wage	899	49.6
Insurance		
Yes	1251	69.1
No	560	30.9
Ever been to dentist		
Yes	1370	75.6
No	441	24.4
Total	1811	100.0

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Table 2. Frequency of sources of fear in DFS questionnaire items

Questions	No Fear	Some Fear	Moderate Fear	High Fear	Extreme Fear	Total
The source of fear during treatment						
Promise to visit the dentist	1137 (62.8%)	519 (28.7%)	110 (6.1%)	24 (1.3%)	21 (1.2%)	1811 (100%)
Approach the dentist's clinic	1310 (72.3%)	391 (21.6%)	82 (4.5%)	19 (1.0%)	9 (0.5%)	1811 (100%)
Sit in the dentist's waiting room	1140 (62.9%)	526 (29.0)	112 (6.2%)	21 (1.2%)	12 (0.7%)	1811 (100%)
Sitting in the dental care chair	898 (55.7%)	671 (37.1%)	184 (10.2%)	42 (2.3%)	16 (0.9%)	1811 (100%)
Smell of the dental clinic	1307 (72.2%)	365 (20.2%)	96 (5.3%)	31 (1.7%)	12 (0.7%)	1811 (100%)
Seeing the dentist enter the room	1133 (62.6%)	509 (28.1%)	132 (7.3%)	23 (1.3%)	14 (0.8%)	1811 (100%)
The sight of syringe for anaesthesia	579 (32.0%)	667 (36.8%)	372 (20.5%)	113 (6.2%)	80 (4.4%)	1811 (100%)
The feeling of injected syringe	554 (30.6%)	744 (41.1%)	309 (17.1%)	127 (7.0%)	77 (4.3%)	1811 (100%)
Seeing the dental drill	623 (34.4%)	655 (36.2%)	347 (19.2%)	100 (5.5%)	86 (4.7%)	1811 (100%)
The sound of the dental drill	636 (35.1%)	688 (38.0%)	321 (17.7%)	89 (4.9%)	77 (4.3%)	1811 (100%)
The vibration of the dental drill	565 (31.2%)	714 (39.4%)	347 (19.2%)	100 (5.5%)	85 (4.7%)	1811 (100%)
After the teeth cleaning process	1287 (71.1%)	381 (21%)	94 (5.2%)	32 (1.8%)	17 (0.9%)	1811 (100%)

Table 3. MDAS and DFS nonparametric test results based on sociodemographic status

Variable	MDAS Median (Mean±SD)	p value	DFS Median (Mean±SD)	p value
Gender				
Male	9.00(9.85±4.08)	0.0001*	30.00(33.13±12.06)	0.0001*
Female	10.00(10.86±4.12)		33.00(35.42±12.24)	
Region				
North Jakarta	9.00(10.02±3.77)	0.0001*	30.00(32.28±10.74)	0.0001*
Central Jakarta	9.00(9.55±4.03)		31.00(33.25±11.81)	
East Jakarta	10.00(10.92±4.13)		33.00(35.65±12.44)	
West Jakarta	10.00(10.49±4.54)		31.00(34.86±13.27)	
South Jakarta	9.00(9.83±3.88)		31.00(33.09±11.38)	
Thousand Islands	11.00(11.13±4.06)		33.50(36.04±13.08)	
Age of subject				
17–25 years old	10.00(10.51±4.09)	0.0001*	32.00(34.93±12.18)	0.0001*
26–35 years old	10.00(10.34±4.18)		32.00(34.47±12.07)	
36–45 years old	9.00(10.06±4.05)		30.00(32.98±11.83)	
46–55 years old	9.00(9.86±4.335)		29.50(32.40±12.86)	
56–65 years old	9.00(9.08±3.507)		25.00(30.00±11.19)	
Education				
Higher Education	9.00(9.68±4.06)	0.0001*	30.00(32.92±12.31)	0.0001*
Secondary Education	10.00(10.36±4.00)		31.00(34.51±12.13)	
Basic Education	10.00(10.98±4.41)		33.00(34.90±12.08)	
Income				
No income	10.00(10.74±3.99)	0.0001*	32.00(34.96±12.17)	0.0001*
< Minimum wage	10.00(11.11±4.66)		33.50(36.64±13.59)	
≥ Minimum wage	9.00(9.67±3.88)		30.00(32.50±11.21)	
Insurance				
Yes	9.00(9.77±3.98)	0.0001*	31.00(33.48±11.77)	0.0001*
No	10.00(10.98±4.37)		33.00(35.63±12.97)	
Ever been to dentist				
Yes	9.00(9.91±3.86)	0.0001*	30.00(33.07±11.17)	0.0001*
No	11.00(11.50±4.68)		34.00(37.48±14.43)	

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The sociodemographic data for the education variable showed that the highest proportion had a high school education (921 respondents, 50.9%), while 381 (21%) had a basic education. Furthermore, 899 respondents (49.6%) received income above the minimum wage (minimum wage in Jakarta is rupiah 3,648,035), and a majority (1251, 69.1%) also had either government (BPJS) or private insurance. A total of 1370 respondents (75.6%) have been to the dentist, while the remaining 441 (24.4%) have not.

In this study, the levels of dental anxiety in 1811 respondents were as follows: high-level anxiety in 216 respondents (11.9%), extreme anxiety in 79 respondents (4.4%), moderate anxiety in 461 respondents (25.5%), low anxiety in 842 respondents (46.5%) and no anxiety in 213 respondents (11.8%). Moreover, the DFS questionnaire (Table 2) attributed the main source of fear to the sight and sensation of dental drills and anaesthesia (questions 7–11). This was indicated by the Likert scale, with scores of 4 (high fear) and 5 (extreme fear). The percentages of dental fear

Table 4. The MDAS and DFS chi-square test results based on sociodemographic status

Variable	Dental Anxiety (%)						Dental Fear (%)			
	Not Anxious	Somewhat Anxious	Moderately Anxious	Highly Anxious	Extremely Anxious	p value	No Fear	Low Fear	Extreme Fear	p value
Gender										
Male	14.7	47.6	23.5	10.5	3.7	0.0001*	67.8	24.5	7.7	0.001
Female	8.0	45.1	27.9	13.8	5.3		58.9	31.0	10.0	
Region										
North Jakarta	10.7	49.0	27.7	10.35	2.3		69.0	24.0	7.0	
Central Jakarta	16.9	48.8	20.4	10.4	3.5		67.7	25.9	6.5	
East Jakarta	6.8	44.9	30.0	13.0	5.3	0.0001*	58.7	31.6	9.7	0.088
West Jakarta	15.1	43.8	21.0	13.6	6.4		62.9	26.0	11.1	
South Jakarta	13.9	49.2	22.8	11.3	2.9		64.9	28.3	6.8	
Thousand Islands	4.5	41.8	37.3	10.9	5.5		62.7	25.5	11.8	
Age of subject										
17–25 years old	8.8	46.7	28.2	11.5	4.8		60.3	30.6	9.2	
26–35 years old	11.6	46.4	25.3	11.6	5.1		64.0	28.3	7.7	
36–45 years old	15.0	46.2	22.0	13.9	2.9	0.0001*	67.4	23.1	9.5	0.024*
46–55 years old	18.4	45.3	20.5	12.1	3.7		71.6	19.5	8.9	
56–65 years old	21.6	51.4	18.9	8.1	0.0		78.4	16.2	5.4	
Education										
Higher	14.2	53.0	19.5	9.4	3.9		70.7	22.2	7.1	
Secondary	11.2	44.7	28.1	12.6	3.4	0.0001*	62.1	28.2	9.7	0.003*
Basic	10.0	42.3	27.0	13.4	7.3		59.3	32.0	8.7	
Income										
No income	7.5	45.1	29.4	13.4	4.6		60.3	29.4	10.2	
< Minimum wage	11.5	38.6	27.0	15.7	7.2	0.0001*	55.0	33.0	12.0	0.0001*
≥ Minimum wage	14.1	51.1	22.6	9.3	2.9		70.1	23.6	6.3	
Insurance										
Yes	10.5	41.3	24.3	18.0	5.9	0.0001*	57.3	31.6	11.1	0.0001*
No	12.3	48.8	26.0	9.2	3.7		66.8	25.5	7.7	
Ever been to dentist										
Yes	9.3	37.9	27.4	16.6	8.8	0.0001*	53. 3	33.1	13.6	0.0001*
No	12.6	49.3	24.8	10.4	2.9		67.3	25.5	7.2	

*p = < 0.05: significant

Table 5. Binary logistic regression analysis with DFS and MDAS

Variable	MDAS		DFS	
	p value	Odds ratio	p value	Odds ratio
Gender	0.05	0.631	0.0001*	0.660
Age	0.253	0.621	0.008*	0.646
Education	0.017*	0.543	0.169	0.843
Income	0.780	1.080	0.507	0.925
Insurance	0.138	1.428	0.001*	1.411
Ever been to dentist	0.0001*	2.854	0.0001*	1.756

*p = < 0.05: significant; Nagelkerke R2 DFS = 0.05; Nagelkerke R2 MDAS = 0.066

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in this study were as follows: high fear in 76 participants (4.2%), moderate fear in 693 participants (38.3%), low fear in 872 participants (48.2%) and no fear in 170 participants (9.4%). Bivariate analysis was performed to establish a relationship between gender, region, age, education, income, insurance and history of dental visits (independent variables) and MDAS and DFS (dependent variables). This analysis involved the use of nonparametric tests (Table 2) and chi-square tests (Tables 3 and 4).

Table 3 shows the nonparametric test results obtained using the Mann-Whitney/Kruskal-Wallis tests and indicates a significant difference in MDAS and DFS scores in terms of all the variables. MDAS and DFS scores were higher for females (10.00[10.86±4.12]; 33.00[35.42±12.24]) than males (9.00[9.85±4.08]; 30.00[33.13±12.06]), and the age group of 17–25-year-olds scored the highest (10.00[10.51±4.09]; 32.00[34.93±12.18]). The scores declined with the subsequent increase in age groups. Furthermore, the education variables show higher MDAS and DFS scores in participants with lower levels of education (10.00[10.98±4.41]; 33.00[34.90±12.08]) and in those with no or low income below the minimum wage (10.00[10.74±3.99]; 33.50[36.64±13.59]). Individuals without insurance and those who had never visited a dentist indicated a higher level of fear and anxiety (11.00[11.50±4.68]; 34.00[37.48±14.43]).

The chi-square test results in Table 4 showed significant differences in the gender variables: females had a higher proportion of moderate to extreme anxiety and fear towards dental care compared to males. This phenomenon is also higher among the age groups of 17–45-year-olds compared to individuals between 46 and 65 years old. This study also identified differences based on education level, income, insurance and history of dental visits.

DISCUSSION

Sociodemographic factors (gender, age, education, etc.) play a role in determining an individual's fear and anxiety towards dental care.[16] The gender variable in this study based on bivariate nonparametric and chi-square analysis of the MDAS and DFS scores had a p value of < 0.05, indicating the presence of statistically significant differences, with a higher mean score for females than males (Tables 4 and 5). This outcome was congruent with the studies conducted by Saatchi et al.[14] and Fayad et al.[7]. Furthermore, physiological conditions in the nature of phobias, panic, stress, depression and fear are also more common in females; hence, there is a possibility that dental anxiety is related to these.

Age is one of the factors commonly reported in various studies; although this study reported a significantly higher level of dental fear and anxiety in adolescents than in adults, this contradicts previous studies that found increased dental anxiety in adults 31–35 years of age and which decreased after 60+ years.[8] Do Nascimento et al.[17] found that the highest scores (found in the age group of 30–39-year-olds) were a result of the relationship between age, an individual's experiences and views and their maturity level.[18] This assumption is supported by the research conducted by Fayad et al.[7]

This study demonstrates that a person's educational status (primary, secondary or higher) affects the level of fear and anxiety because of the significant differences based on the nonparametric and chi-square tests; the results of this study indicate that the higher a person's education, the lower the level of dental fear and anxiety. These findings are consistent with other studies that associated a higher level of education to reduced anxiety related to dental care.[7,17] An individual with a higher level of education is more likely to maintain better oral health and visit the dentist more frequently.[8] This finding is contrary to other studies that reject the assumptions that stipulate the presence of a relationship.[7,14]

An assessment of the socioeconomic factors related to fear and anxiety towards dental care shows less fear among individuals with higher socioeconomic status. This is congruent with a study conducted by Armfield et al.[18] in Australia, although other studies showed different results.[17] The ability to pay for dental care or affiliated insurance premiums is directly related to an individuals' job status, income and wealth.[19] The results obtained from the bivariate analysis with nonparametric tests between MDAS and DFS scores with the coverage value showed a p value of < 0.05, which indicates a statistically significant difference between anxiety and fear between people who have insurance and those who do not; this may be because insurance can lower cost-related stress related to dental treatment. However, there are several types of insurance that have limited coverage, especially in terms of some dental procedures, so this can cause concern. There is a need for a broader level of insurance for someone with a higher level of fear, followed by a demand for more care needs. This study provides the same results as previous studies that reported a relationship between dental fear and individuals who have private insurance.[18]

The regularity of dental visits is considered another important contributor to fear and anxiety for dental care. In this study, the results of the bivariate analysis using nonparametric tests between MDAS and DFS scores showed a p value of < 0.05, which means that the difference is statistically significant between the MDAS and DFS scores of respondents who visited the dentist (MDAS: 9.00[9.91±3.86]; DFS: 30.00[33.07±11.17]) and those who never visited the dentist (MDAS: 11.00[11.50±4.68]; DFS: 34.00[37.48±14.43]). This was in line with the research conducted by Doganer et al.,[20] which showed higher anxiety in participants evading dental treatment than those attending regular appointments. Therefore, patients with fear tend to keep their dental appointments only when necessary (e.g. when they can no longer endure the pain); they also avoid routine dental visits.[20]

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The chi-square test results between MDAS and DFS scores in relation to respondents' visits to the dentist indicated the absence of statistically significant differences ($p = > 0.05$). Furthermore, the results show an absence of any possible influence on fear and anxiety towards dental care due to the higher proportion of respondents that regularly visit the dentist. This outcome was in contrast with the results of Svensson et al.,[8] which demonstrated a significant difference between dental anxiety and the rate of visits.

Based on the results and discussion, the percentages of dental fear and anxiety in the province of Jakarta were 4.2% (high fear), 38.3% (moderate fear), 4.4% (extremely anxious) and 25.5% (moderately anxious). In this study, several sociodemographic factors were confirmed to be related to dental fear and anxiety. In addition, nonparametric test results showed an association between gender, age and income level ($p < 0.05$), while the chi-square results confirmed a correlation between gender and dental anxiety ($p < 0.05$) as well as income level and dental fear ($p < 0.05$). The limitation of this study is that it cannot explain the relationship between sociodemographic factors and dental fear and anxiety, so further longitudinal research is required. However, there are several other factors that are expected to be analysed in future research: the relationship between dental fear and anxiety and respondent behaviours, dental treatment experiences, dentist attitudes and others.

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