



## **Relationship Between Anxiety Levels and Patient Adherence to Dental Treatment**

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### **Abstract**

**Background and Objective:** Patient compliance in undergoing dental treatment is a crucial factor for the success of therapy. However, it is often influenced by various factors, including psychological conditions such as anxiety levels. Therefore, this study aimed to determine whether there is a relationship between anxiety levels and patient compliance in receiving dental treatment at Cut Mutia General Hospital, North Aceh. **Methods:** This research employed a quantitative approach with a cross-sectional design. Data were collected using structured questionnaires distributed to outpatients in the dental care unit. The relationship between anxiety levels and patient compliance was analyzed using the Chi-Square statistical test. **Results:** The analysis revealed a statistically significant relationship between anxiety levels and patient compliance in undergoing dental treatment (Chi-Square value = 9.574;  $p = 0.008$ ). Patients with mild anxiety exhibited a compliance rate of 64%, while those who felt calm showed the highest compliance rate at 84.6%. In contrast, patients with moderate anxiety demonstrated the lowest compliance rate at only 25%. These findings indicate that lower anxiety levels are associated with higher patient compliance in following dental treatment recommendations. **Conclusion and Recommendation:** The study concludes that there is a significant statistical relationship between anxiety levels and patient compliance in dental care at Cut Mutia General Hospital, North Aceh. Patients with lower anxiety tend to show higher compliance. It is recommended to implement psychological interventions, including educational approaches and empathetic communication, to reduce anxiety and enhance patient adherence to dental treatment procedures.

**Keywords:** Anxiety, Patient Compliance, Dental Treatment, Hospital, Cut Mutia General Hospital.

### **Introduction**

Dental and oral health problems are an urgent public health issue due to their wide-ranging impact on general health and individual quality of life. Poor dental health can lead to

various problems, including infections, pain, and impaired chewing function, all of which contribute to difficulties in communication and carrying out daily activities. According to the World Health Organization (WHO) report on the status of dental and oral health in 2022, approximately 3.5 billion people worldwide suffer from dental and oral diseases. Indonesia ranks second in Southeast Asia for the highest dental healthcare expenditure, following Singapore (US\$ 1,160). In Indonesia, the main dental and oral health problems include a high prevalence of dental caries, limited accessibility to dental care, and a lack of education on the importance of maintaining oral hygiene. The 2023 Basic Health Research (Riskesdas) reported a dental caries prevalence rate of 88.80%. The 2023 Indonesia Health Survey (SKI) indicated that 57% of individuals aged  $\geq 3$  years experienced dental and oral health problems in the past year, marking a slight decrease of 0.5% compared to the 2018 Riskesdas findings.

The five provinces with the highest prevalence of dental and oral health issues are West Sulawesi (68.4%), South Sulawesi (68.4%), Central Sulawesi (66.5%), North Sulawesi, and Maluku (64.9%). Conversely, the provinces with the lowest rates are Bali (46.5%), Bangka Belitung (46.9%), and Papua (49.4%). The 2023 SKI results for dental examinations show that the DMF-T (Decayed, Missing, and Filled Teeth) index for all age groups has declined compared to the 2018 Riskesdas results. However, dental and oral health in Indonesia still requires greater attention, as the DMF-T index for the age groups 3–4 years, 5 years, and  $>35$  years remains in the high and very high categories. Despite the high number of people experiencing dental and oral health issues, only about 11.2% seek treatment from healthcare professionals. Many individuals delay or avoid treatment for several reasons, including fear of Covid-19 exposure (81.7%), long waiting times for services (80.2%), self-treatment preferences (79.3%), visiting traditional or unlicensed dental practitioners (77.5%), perception of no treatment costs (76.7%), and the absence of perceived pain in their teeth (70.2%). One of the key reasons for the low utilization of professional dental and oral healthcare services is anxiety.

Anxiety is a significant mental health issue both in Indonesia and globally, influencing individuals' willingness to seek timely and proper treatment (Bandelow & Michaelis, 2015a). About 4% of the global population experiences anxiety disorders, equivalent to approximately 301 million people (Basrowi et al., 2024a, 2024b; Javaid et al., 2023). In Indonesia, the prevalence of mental disorders, including anxiety, is estimated to reach 20% of the population, with 26.6% of respondents experiencing mild to severe anxiety. Data indicate that anxiety is the most common mental disorder among adolescents aged 10–17 years, and the prevalence of anxiety disorders among adults is also increasing, reflecting a significant challenge in the management of mental health in the country (Ayuningtyas et al., 2018; Bestari & Wati, 2016). In the healthcare context, anxiety is one of the key factors that significantly influence patients' actions and behaviors, particularly in terms of adherence to medical care recommendations. High levels of anxiety can cause patients to hesitate in following doctors' instructions, including in dental care, which is often perceived as intimidating by many individuals. Various studies have shown that patients experiencing anxiety tend to have lower levels of compliance with medical instructions, potentially leading to more serious health complications and less satisfactory treatment outcomes. According to several studies, factors such as fear of medical procedures, concerns about treatment costs, and a lack of understanding of the importance of

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the recommended care are among the main causes of this non-compliance (Mayo-Wilson et al., 2014; Pavlova et al., 2015; Wen et al., 2021).

Anxiety not only affects a patient's decision to undergo treatment but can also trigger broader behavioral changes. Symptoms of anxiety may include withdrawal from social interaction, difficulty concentrating, disturbances in eating patterns, and increased irritability. In addition, patients may struggle to regulate their emotions, experience irrational thinking, and suffer from sleep disturbances (Uher, 2023). During the course of treatment, many patients experience discomfort and anxiety due to the monotonous hospital environment, as well as a lack of information provided by healthcare professionals, particularly nurses (Mayo-Wilson et al., 2014). In the context of dental care, the role of dental nurses is crucial in helping patients manage anxiety. Adherence to dental treatment is essential, as it contributes to better oral health and helps prevent more serious dental diseases. Conversely, low levels of adherence can lead to long-term health problems, which not only harm individuals but also place a greater burden on the healthcare system as a whole. Dental nurses who demonstrate caring behaviors—such as actively listening, providing supportive presence, and offering clear and adequate explanations—can enhance patients' confidence and reduce stress (Bandelow & Michaelis, 2015b). Based on initial observations at Cut Mutia General Hospital in North Aceh, patient visit data for dental care in 2023 showed a total of 1,820 visits, with an average of 150 patients per month. Of these, approximately 60% (1,080 visits) were directly related to complaints of dental caries and other oral health problems. The prevalence of caries among patients seeking treatment was recorded at 85%, indicating that the majority of patients suffered from serious dental issues. In 2024, the number of visits decreased to 1,656, representing an estimated 11% decline compared to the previous year.

If this trend continues, the number of visits related to dental caries is also expected to decrease, reaching around 960 visits, or roughly 60% of the total visits. One of the suspected factors contributing to this decline is patient anxiety. In daily practice, many patients experience anxiety when undergoing dental care procedures, which are often perceived as frightening and painful. This anxiety ultimately influences their decision to follow medical advice, including their willingness to accept treatment recommended by dentists. Adherence to dental treatment is crucial, as it can contribute to better oral health and prevent more severe dental diseases. Conversely, low adherence levels can lead to long-term health problems, which not only harm individuals but also place an additional burden on the healthcare system as a whole. Given the above background, there is a need to conduct research on the relationship between anxiety levels and patient compliance with dental care at Cut Mutia General Hospital in North Aceh.

## **Literature Review**

Research conducted by Vanessa Sirait et al., (2024) found that high levels of anxiety among patients are negatively associated with adherence to fixed denture treatment. In such cases, patients experiencing anxiety tend to delay or avoid the treatment, which in turn leads to poor dental health outcomes. Research conducted by Pamikatsih, (2022) demonstrates that

effective education and communication between healthcare providers and patients can reduce anxiety levels and enhance compliance in dental care. Patients who feel supported and receive clear information are more likely to follow treatment instructions consistently. Research findings support this conclusion, as reported by (Sagrang et al., 2017) who found that patients with high anxiety were three times less likely to adhere to dental treatment compared to those who remained calm. Furthermore, research by Sari Santika (2021) also indicated that effective education and communication from healthcare providers can reduce patient anxiety, thereby improving adherence to dental care. Furthermore, the coping stress theory proposed by Lazarus and Folkman (1984) provides a relevant theoretical framework for understanding the relationship between anxiety and patient compliance.

According to this theory, stress or anxiety is not merely an emotional response, but is also influenced by how individuals appraise the situations they face, as well as the strategies they employ to cope with them. Lazarus and Folkman categorize coping strategies into two main types: problem-focused coping, which emphasizes solving the problem, and emotion-focused coping, which emphasizes managing emotional responses. Individuals who lack effective coping strategies tend to respond to anxiety by avoiding, delaying, or even refusing to undergo medical procedures, including dental care.

## **Research Method**

This study employed an analytical method with a cross-sectional design to examine the relationship between anxiety levels and patient compliance in undergoing dental treatment at Cut Mutia General Hospital, North Aceh. The study population comprised all patients visiting the hospital's dental clinic during the research period, with a sample of 50 respondents selected through an accidental sampling technique, namely patients who happened to visit during the study period. Inclusion criteria included patients aged 18–65 years, diagnosed with dental problems requiring treatment, having the opportunity to follow home care instructions, providing informed consent to participate, and being able to communicate and understand instructions. Exclusion criteria included patients with mental or physical disorders affecting anxiety and compliance, those undergoing intensive dental treatment at the clinic or hospital, patients taking medications that could affect anxiety levels, and individuals who declined participation after receiving an explanation of the study. The research was conducted at the dental clinic of Cut Mutia General Hospital, North Aceh, from March 20 to April 5, 2025, using research instruments such as an anxiety level questionnaire, interview guidelines, informed consent forms, and Visual Analog Scale observation sheets.

The research procedure involved obtaining a referral letter from the Bachelor of Applied Dental Therapy Program at the Health Polytechnic of the Ministry of Health, Aceh, submitting a research permit to the hospital, preparing research instruments, seeking permission and consent from eligible respondents, recording personal information and blood pressure history, measuring anxiety levels while respondents waited for treatment, and subsequently processing and analyzing the data. Data processing consisted of editing to ensure completeness and consistency, coding to assign numerical values or specific codes, transferring

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to systematically enter coded data into tables, and tabulating to present the corrected data according to its characteristics and the study objectives. Data analysis was conducted using univariate analysis to describe each variable in frequency and percentage distributions and bivariate analysis using the Chi-Square test with a significance level of  $\alpha < 0.05$  to evaluate the relationship between anxiety level (independent variable) and patient compliance (dependent variable) in dental treatment.

### **Result**

#### **General Overview of the Research Location**

Cut Meutia General Hospital (RSU Cut Meutia) is located in Lhokseumawe, Aceh, Indonesia, specifically on Jalan Banda Aceh–Medan Km.6, Bukit Rata. The hospital is classified as a Class B hospital and operates under the Regional Public Service Agency (BLUD) status, which provides greater flexibility and professionalism in delivering public services. RSU Cut Meutia occupies a land area of 113,808 m<sup>2</sup> and is equipped with 135 patient beds, indicating its capacity to serve a large number of patients (Wikipedia, 2023). Historically, RSU Cut Meutia began as a plantation hospital owned by the Dutch colonial government. Following Indonesia's independence, the hospital was taken over by the Indonesian government and transformed into a public healthcare facility. Since 1961, the hospital has undergone several expansions and capacity improvements. In 2011, its classification was upgraded from Class D and C to Class B, marking significant enhancements in service quality and facilities for the Acehnese community (Wikipedia, 2023; Halodoc, 2023). Since the reclassification in 1987, RSU Cut Meutia has provided specialized healthcare services, supported by the addition of new buildings in 1998 and an increase in bed capacity in 2002 to accommodate growing patient needs. Currently, the hospital is staffed by general practitioners and various medical specialists, including internists and dentists, ensuring comprehensive healthcare services. As the primary referral center in North Aceh and surrounding areas, RSU Cut Meutia plays a strategic role in the regional healthcare system, also serving patients from neighboring districts and municipalities who require specialized medical facilities (Aceh Herald, 2023).

#### **Respondent Characteristics**

Respondent characteristics describe the demographic and socio-economic profile of the study participants, which in this research included age, gender, education, occupation, and medical history.

##### **Age**

In this study, age refers to the number of years a person has lived since birth. It serves as an indicator to classify individuals according to physical, mental, and social developmental stages.

**Table 1. Age Distribution of Respondents**

Age (Years)	Frequency (n)	Percentage (%)
20–29	19	38
30–39	21	42
40–49	10	20
Total	50	100

The table shows that the majority of respondents were aged 30–39 years (42%), indicating that most participants were young to middle-aged adults, a group generally considered to have better awareness and ability to comply with healthcare instructions, including dental care. The relatively balanced distribution also reflects a good representation of productive age groups in the hospital's patient population.

### **Gender**

Gender is a biological category distinguishing individuals as male or female based on physical and genetic characteristics, such as reproductive organs and chromosomes, which can also influence health behavior and outcomes.

**Table 2. Gender Distribution of Respondents**

Gender	Frequency (n)	Percentage (%)
Male	22	44
Female	28	56
Total	50	100

Of the 50 respondents, females were slightly more represented at 56% (28 people), compared to males at 44% (22 people). This slight predominance of female participation could potentially influence the research results, especially in variables where behavioral or psychological responses differ between genders.

### **Education**

Education refers to the formal process of learning and acquiring knowledge, skills, values, and attitudes.

**Table 3. Educational Level of Respondents**

Education Level	Frequency (n)	Percentage (%)
Primary	24	48.0
Secondary	13	26.0
Higher	13	26.0
Total	50	100.0

Almost half of the respondents (48%) had only primary education, indicating a relatively low educational background. The distribution between secondary and higher education was equal, though the primary education group remained the largest.

## Occupation

Occupation refers to a person's regular activities undertaken to earn income or meet daily needs.

**Table 4. Occupation of Respondents**

Occupation	Frequency (n)	Percentage (%)
Civil Servant	12	24.0
Entrepreneur	15	30.0
Labor/Employee	10	20.0
Housewife	8	16.0
Student	5	10.0
Total	50	100.0

The majority of respondents were entrepreneurs (30%), followed by civil servants (24%) and laborers/employees (20%). This diversity in occupational backgrounds may influence anxiety and compliance levels in dental treatment.

## Type of Dental Treatment

During the study, all respondents received dental treatments tailored to research protocols and their clinical conditions, based on baseline assessments including oral hygiene, reported symptoms, and clinical findings. Treatments included both non-invasive and minimally invasive procedures. Non-invasive interventions consisted of oral health education, such as counseling on oral hygiene, proper tooth brushing techniques, dental floss use, and healthy eating habits. Clinical interventions included comprehensive dental examinations, scaling, topical fluoride application (when needed), and minor restorative procedures such as simple fillings.

**Table 5. Types of Dental Treatment Received by Respondents**

No	Type of Dental Treatment	n	(%)
1	Scaling (tartar removal)	20	40%
2	Simple cavity filling	15	30%
3	Tooth extraction (clinical indication)	10	20%
4	Topical fluoride application	5	10%
Total		50	100%

The most common procedure was scaling, performed on 40% of respondents.

## Univariate Analysis

Univariate analysis describes the characteristics of each research variable individually without examining relationships between variables. This study focused on two main variables: patient compliance and patient anxiety during dental treatment at RSU Cut Meutia.

**Patient Compliance**

Compliance refers to the willingness and discipline to follow prescribed rules or recommendations.

**Table 6. Patient Compliance in Dental Treatment (n=50)**

Compliance Level	Frequency (n)	Percentage (%)
High Compliance	30	60
Moderate Compliance	20	40
Low Compliance	0	0
Total	50	100

The data shows that 60% (30 respondents) had high compliance, while 40% (20 respondents) had moderate compliance. No respondents were categorized as having low compliance.

**Patient Anxiety**

Anxiety is a feeling of worry or fear when facing certain situations or events.

**Table 7. Patient Anxiety Levels in Dental Treatment (n=50)**

Anxiety Level	Frequency (n)	Percentage (%)
Calm	13	26
Mild Anxiety	25	50
Moderate Anxiety	12	24
Severe/Panic	0	0
Total	50	100

Half of the respondents (50%) experienced mild anxiety during dental treatment, 26% were calm, and 24% had moderate anxiety. No respondents experienced severe anxiety or panic, indicating that most patients tended to have mild to moderate anxiety levels.

**Bivariate Analysis**

The bivariate analysis in this study was conducted to determine the relationship between patients' anxiety levels and their compliance with dental treatment at Cut Meutia General Hospital, North Aceh. The statistical test used was the Chi-Square test to evaluate the significance of the association between the variables.



**Table 9. Chi-Square Test Results for the Relationship Between Anxiety Levels and Patient Compliance in Dental Treatment at Cut Meutia General Hospital, North Aceh (n=50)**

Anxiety Level	High Compliance n (%)	Moderate Compliance n (%)	Total (n)	(%)	p-value	df	Pearson Chi-Square
Calm	11 (84.6%)	2 (15.4%)	13	100	0.008	2	9.574
Mild Anxiety	16 (64.0%)	9 (36.0%)	25	100			
Moderate Anxiety	3 (25.0%)	9 (75.0%)	12	100			
Severe/Panic	0 (0.0%)	0 (0.0%)	0	100			
Total	30 (60.0%)	20 (40.0%)	50	100.0			

The Chi-Square test yielded a Pearson Chi-Square value of 9.574 with 2 degrees of freedom (df) and a p-value of 0.008, which is less than the significance threshold of 0.05. These results indicate a statistically significant relationship between patients' anxiety levels and their compliance with dental treatment at Cut Meutia General Hospital, North Aceh. In other words, the lower the anxiety level, the higher the likelihood of patients demonstrating strong compliance in following their dental care regimen.

## Discussion

Based on the research conducted to examine the relationship between anxiety levels and patient compliance in undergoing dental treatment at Cut Mutia General Hospital, North Aceh, the Chi-Square test results revealed that the Pearson Chi-Square value was 9.574 with a degree of freedom (df) of 2 and a significance value (p-value) of 0.008. This p-value is smaller than the commonly accepted significance threshold of 0.05, indicating a statistically significant relationship between anxiety levels and patient compliance in dental treatment at Cut Mutia General Hospital, North Aceh. The findings showed that the majority of patients at Cut Mutia General Hospital were classified as compliant with dental care recommendations, accounting for 60% or 30 out of the total 50 respondents. However, 40% or 20 patients were non-compliant with dental care instructions. Furthermore, most patients experienced mild anxiety during treatment, representing 50% or 25 individuals. Meanwhile, 26% or 13 patients were in a calm state, and the remaining 24% or 12 individuals experienced moderate anxiety. These results indicate variations in anxiety levels among patients, which appear to be associated with their compliance with dental treatment.

The researcher assumes that anxiety level is one of the factors influencing patient compliance. Patients with lower anxiety levels—such as those with mild anxiety or who remain calm—tend to show higher compliance with the treatment recommendations provided by medical personnel (Mariyana et al., 2024). Conversely, patients experiencing moderate to high anxiety are more likely to disregard instructions or treatment schedules, which may ultimately affect the effectiveness of dental care itself. This assumption is supported by the distribution data, showing that the majority of compliant patients fell into the mild anxiety category (Hasni et al., 2024). Managing patient anxiety—through educational approaches, therapeutic

communication, or appropriate psychological interventions—becomes an essential component that needs to be integrated into dental healthcare services. The success of dental treatment is not determined solely by medical factors but also by psychological aspects such as anxiety, which, if left unaddressed, can hinder the achievement of optimal treatment outcomes (Mariyana et al., 2024). These findings are consistent with various previous studies showing that anxiety levels influence patient compliance behavior in healthcare services, including in dental care (Dewi et al., 2019).

Managing anxiety through effective communication, adequate patient education, and psychological interventions is therefore crucial to reducing anxiety levels and improving patient compliance in dental treatment. Strategies to alleviate patient anxiety should include providing comprehensive education about treatment procedures, adopting an empathetic and supportive communication approach, and creating a comfortable and welcoming treatment environment. Healthcare professionals should be trained to recognize signs of patient anxiety and to employ stress management techniques, such as relaxation exercises or clear explanations before and during treatment, to help patients feel safer and more confident.

## **Conclusion**

Based on the results and discussion, it can be concluded that there is a statistically significant relationship between anxiety levels and patient compliance in undergoing dental treatment at Cut Mutia General Hospital, North Aceh. This finding is supported by the Pearson Chi-Square test result of 9.574 with 2 degrees of freedom (df) and a significance value (p-value) of 0.008 ( $p < 0.05$ ). Given these findings, it is recommended that dental healthcare providers implement targeted interventions to reduce patient anxiety before and during dental treatment. This may include providing clear and reassuring information, creating a more comfortable treatment environment, and offering relaxation techniques or counseling when needed. By addressing patient anxiety, compliance with dental care instructions can be improved, ultimately enhancing treatment outcomes and patient satisfaction.

## **Declaration of conflicting interest**

The authors declare that there is no conflict of interest in this work.

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