Personalized Medicine in Psychiatry 53–54 (2025) 100169

Contents lists available at ScienceDirect

Personalized Medicine in Psychiatry

journal homepage: www.sciencedirect.com/journal/personalized-medicine-in-psychiatry

Young Adults' experiences of dental Anxiety: A multidisciplinary qualitative study of Triggers, Avoidance, and intervention strategies

Azizi Ab Malek [a,*], Nawwal Alwani Mohd Radzi [a], Muhd Firdaus Che Musa [b]

[a] Centre of Population Oral Health and Clinical Prevention Studies, Faculty of Dentistry, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor 47000, Malaysia
[b] Department of Pediatric Dentistry and Dental Public Health, Kulliyyah of Dentistry, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia

ARTICLE INFO

Keywords:
Dental anxiety
Specific phobia
Young adults
Qualitative study
Avoidance behavior
Sensory processing sensitivity
Trauma-informed care
Malaysia

ABSTRACT

Dental anxiety is a clinically significant condition that shares core features with specific phobia, including anticipatory fear, autonomic arousal, and behavioral avoidance. Particularly prevalent among young adults, dental anxiety contributes to delayed treatment, deteriorating oral health, and psychological distress. Despite various intervention efforts, limited research has examined the emotional, cognitive, and contextual factors underlying dental anxiety through a multidisciplinary lens. This qualitative study explored the lived experiences and clinical insights of young adults, dentists, and mental health professionals in managing dental anxiety. Using Braun and Clarke's reflexive thematic analysis, data from focus group discussions with 18 dentists and in-depth interviews with 16 high-anxiety young adults (MDAS $\geq$ 19) and 4 mental health professionals (clinical psychologists and psychiatrists) were inductively analyzed with NVivo software. Ten interrelated themes emerged across five core domains: (1) psychological mechanisms including autonomic symptoms and anxiety-driven behaviors; (2) trauma-related conditioning rooted in early dental experiences; (3) cognitive-affective patterns shaped by trust, fear of the unknown, and perceived control; (4) intervention preferences emphasizing visual tools and empathic delivery; and (5) behavioral and systemic outcomes such as treatment avoidance and increased resource demands. Findings support trauma-informed, multidisciplinary care models incorporating early screening, sensory-adapted environments, and structured psychoeducation. Dental anxiety should be reframed within broader mental health frameworks to enhance psychological safety, improve engagement and reduce long-term burden.

Introduction

Dental anxiety is a prevalent psychological condition that impairs help-seeking behavior and adversely affects oral and overall well-being. Defined as a persistent fear of dental procedures or environments, it is associated with avoidance behavior, treatment delay and compromised oral health outcomes [1,2]. From a clinical perspective, dental anxiety exhibits strong overlap with specific phobia, particularly in its expression of anticipatory anxiety, autonomic hyperarousal and avoidance of feared stimuli, aligning with diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Globally, dental anxiety affects between 3 % and 43 % of individuals, with severity influenced by age, gender, past traumatic dental experiences, and comorbid psychiatric conditions such as generalized anxiety disorder (GAD) and depressive symptoms [3,4]. In Malaysia, young adults remain a particularly vulnerable group, often delaying or avoiding dental treatment due to fear of pain, negative early experiences, and discomfort with clinical environments [5,6].

Despite the widespread availability of subsidized public dental care, persistent psychological barriers suggest a disconnect between service accessibility and perceived emotional safety. Recent advances highlight the efficacy of cognitive, behavioral, and sensory-based interventions, including guided imagery, exposure techniques, and sensory-adapted environments in reducing treatment-related distress [3,7,8]. Mobile applications and virtual reality tools also offer novel psychoeducational platforms, while training dental professionals in trauma-informed care and behavioral psychology has shown promise in enhancing patient trust and engagement [9].

In Malaysia, research on dental anxiety has largely focused on prevalence and sociodemographic correlates through cross-sectional surveys. However, few studies have qualitatively examined the lived experience of anxiety in dental settings or explored how

* Correspondence Author..
E-mail address: azizi.malek@moh.gov.my (A.A. Malek).

https://doi.org/10.1016/j.pmip.2025.100169

Available online 30 November 2025

multidisciplinary professionals conceptualize its etiology and management. Moreover, there is limited understanding of how psychologically vulnerable individuals particularly young adults with high dental anxiety respond to various anxiety-reduction strategies across diverse healthcare contexts. This study aims to explore the lived experiences and clinical perspectives of Malaysian young adults, dentists and mental health professionals on dental anxiety. It investigates how features aligned with specific phobia including autonomic arousal, trauma conditioning and cognitive-affective triggers manifest in dental contexts and how trauma-informed, psychologically safe and multidisciplinary interventions can be designed to promote treatment adherence, emotional safety and system-level efficiency.

Materials and Methods

2.1 Participants and Sampling.

This qualitative study employed both Focus Group Discussions (FGD) and In-Depth Interviews (IDI) to explore the psychological, emotional, and behavioral dimensions of dental anxiety (Fig. 1). This design enabled the triangulation of perspectives across key stakeholder groups and facilitated rich inductive insight into anxiety experiences that may be underrepresented in quantitative studies [10].

Purposive sampling was used to recruit information-rich participants with direct experience in managing or experiencing dental anxiety. The FGD sample included 18 dentists: eight from Ministry of Health (MOH) clinics, four from university-based clinics, and six from private practices. The IDI sample included five dentists (all private), four mental health professionals (two clinical psychologists and two psychiatrists), and 16 young adults (aged 15–24 years) (Fig. 2). The young adults were drawn from a prior quantitative study and selected based on Modified Dental Anxiety Scale (MDAS) scores $\geq$ 19, indicating high dental anxiety. Inclusion criteria for dentists included Malaysian citizenship, registration with the Malaysian Dental Council (MDC), a minimum of six years of clinical experience, and no managerial or specialist appointments. Dentists with such profiles were expected to demonstrate consistent use of evidence-informed decision-making, potentially influencing their approach to anxious patients [11]. Mental health professionals were recruited from university clinics in Selangor. Young adults were contacted via telephone or messaging platforms and screened for eligibility using MDAS results.

Data collection and analysis

A total of three FGDs and 25 IDIs were conducted from May to September 2024. Interviews were guided by a semi-structured protocol, adapted from Aarvik et al. and Moore et al., covering seven core domains: anxiety triggers, healthcare utilization, communication experiences, treatment barriers, coping strategies, content design preferences, and intervention recommendations [12,13]. Interviews were conducted in English and Malay, using Google Meet and phone calls (for participants with internet limitations). Each session was audio-recorded with verbal consent and supplemented with detailed field notes. FGDs lasted between 60 and 90 min, and IDIs ranged from 20 to 45 min. Transcripts were verbatim, translated into English, and verified through member checking and independent reviewer validation.

Data were analyzed thematically using Braun and Clarke's six-phase framework, with transcripts coded inductively in NVivo (v1.6.1) [14]. Three researchers independently developed preliminary codes, which were compared, refined, and organized into higher-order categories and themes through team consensus. During analysis, attention was paid to cognitive-affective processes, behavioral patterns and environmental influences in line with models of anxiety and specific phobia.

Trustworthiness and Rigour

Credibility was enhanced via triangulation across participant groups, pilot testing and member validation. The interview guide was validated using the Content Validity Index (CVI) by two experts in Dental Public Health, achieving an S-CVI/Ave $>$ 0.80. One FGD (MOH dentists) functioned as a pilot, conducted face-to-face and was retained for final

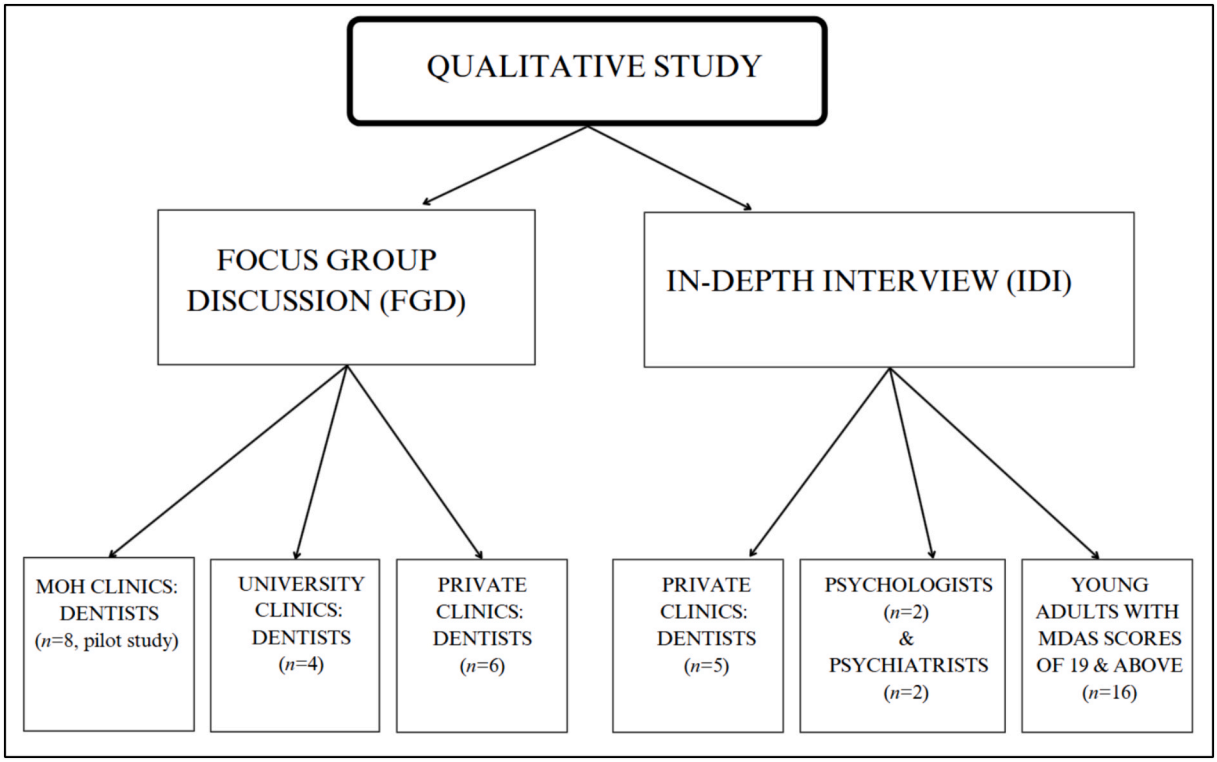

Fig. 1. Distribution of Participants in Focus Group Discussion (FGD) and In-Depth Interview (IDI) in the Qualitative Study.

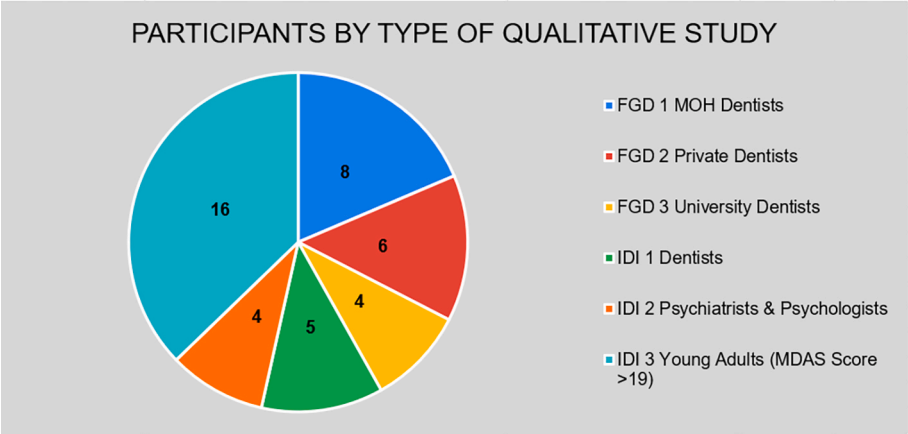

Fig. 2. Distribution of Participants in Focus Group Discussion (FGD) and In-Depth Interview (IDI) in the Qualitative Study.

analysis in line with progressive qualitative methodology [15]. Pilot findings informed iterative refinement of interview questions throughout data collection [15]. This study adhered to ethical research standards and approval was obtained from the Research Ethics Committee, Universiti Teknologi MARA [Ref. No. 600-TNCPI (5/1/6)] and the Malaysian Ministry of Health's National Medical Research Register (NMRR ID-23–02344-S6D).. Informed consent was secured from all participants.

Results

3.1 Demographic characteristics of participants

Table 1 summarizes the demographic characteristics of the 18 participants involved in the FGD with dental professionals. The majority were female (83.3 %) and of Malay ethnicity (83.3 %), with more than half (55.5 %) aged between 35 and 44 years. Most were married (77.8 %) and all held undergraduate dental degrees. In terms of workplace distribution, 44.5 % were employed at Ministry of Health (MOH) dental clinics, 33.3 % in private practices, and 22.2 % at university-based clinics. Regarding years of experience, 44.5 % had worked for 11–15 years, 33.3 % had more than 15 years of experience, and 22.2 % had practiced for 6–10 years. Table 2 provides individual participant details by age, experience, and workplace.

Table 1
Demographic profile of FGD Participants ($n = 18$).

Characteristic	Subcategory	Number of participants	Percentage of participants
Gender	Male	3	16.7 %
	Female	15	83.3 %
Age (years)	25–34	3	16.7 %
	35–44	10	55.5 %
	45–54	3	16.7 %
	55–64	2	11.1 %
Ethnicity	Malay	15	83.3 %
	Indian	3	16.7 %
Marital status	Married	14	77.8 %
	Single	4	22.2 %
Place of work	MOH dental clinic	8	44.5 %
	Private dental clinic	6	33.3 %
	University dental clinic	4	22.2 %
Qualifications	Degree	18	100.0 %
Year of working experiences	6–10	4	22.2 %
	11–15	8	44.5 %
	>15	6	33.3 %

Table 2
Focus Group Discussion Participants characteristics ($n = 18$).

Code	Age (years)	Years of experience (years)	Place of work
DR06	32	6–10	University dental clinic
DR07	43	>15	University dental clinic
DR08	34	11–15	University dental clinic
DR09	50	>15	University dental clinic
DR10	36	11–15	Private dental clinic
DR11	56	>15	Private dental clinic
DR12	32	6–10	Private dental clinic
DR13	38	11–15	Private dental clinic
DR14	64	>15	Private dental clinic
DR15	49	>15	Private dental clinic
MOH01	37	11–15	MOH dental clinic
MOH02	34	6–10	MOH dental clinic
MOH03	37	6–10	MOH dental clinic
MOH04	37	11–15	MOH dental clinic
MOH05	47	>15	MOH dental clinic
MOH06	40	11–15	MOH dental clinic
MOH07	39	11–15	MOH dental clinic
MOH08	39	11–15	MOH dental clinic

Table 3 presents the demographic and professional characteristics of the IDI participants from clinical and mental health fields. This group comprised five dentists, two clinical psychologists and two psychiatrists. The majority were aged between 35 and 54 years and had over a decade of professional experience, reflecting a well-qualified sample of healthcare professionals familiar with managing dental and anxiety-related conditions. Table 4 details the background of the 16 young adult IDI participants, aged between 17 and 24 years. Participants were purposively selected based on their high Modified Dental Anxiety Scale (MDAS) scores (range = 19–25), consistent with criteria for high dental anxiety. Most interviews with this group were conducted by phone, with a few via Google Meet. The inclusion of this cohort allowed for direct insight into the lived experiences of individuals with clinically significant dental anxiety symptoms.

Table 3
In-Depth Interview Participants' Characteristics ($n = 9$).

Code	Age (years)	Years of experience (years)	Position
DR01	40	>15	Dentist
DR02	43	11–15	Dentist
DR03	43	>15	Dentist
DR04	42	>15	Dentist
DR05	43	>15	Dentist
PSY01	54	>15	Psychologist
PSY02	38	11–15	Psychologist
PSY03	39	11–15	Psychiatrist
PSY04	35	6–10	Psychiatrist

Table 4
In-Depth Interview Participants' Characteristics ($n = 16$).

Code	Age (years)	Mode of Interview	MDAS scores
P01	22	Phone call	22
P02	22	Phone call	19
P03	23	Phone call	25
P04	21	Phone call	19
P05	22	Phone call	20
P06	24	Phone call	23
P07	19	Phone call	25
P08	20	Phone call	21
P09	21	Google Meet	25
P10	19	Phone call	25
P11	21	Phone call	22
P12	24	Phone call	24
P13	23	Google Meet	25
P14	23	Phone call	21
P15	23	Google Meet	19
P16	17	Phone call	19

Major themes and subthemes

This qualitative study identified ten key themes, grouped under five overarching domains contributing to the experience and management of dental anxiety among young adults: (1) psychological mechanisms including physiological symptoms and observable behaviors; (2) trauma-linked conditioning and emotional triggers rooted in childhood experiences; (3) cognitive-affective interactions shaped by patient-provider trust, empathy, and perceived control; (4) design preferences for interventions, favoring brief, calming, and visually engaging tools; and (5) the behavioral and systemic consequences of anxiety, including care avoidance, resource burden, and a feedback loop between poor oral and mental health (Fig. 3). These themes were triangulated across young adults, dentists, and mental health professionals, reinforcing the need for trauma-informed, patient-centered, and multidisciplinary care.

Theme 1: Physiological and Behavioral Expressions of Anxiety.

Across all participant groups, dental anxiety manifested through a range of physiological responses and avoidance behaviors. Young adults frequently described intense autonomic symptoms such as palpitations, trembling, shortness of breath and sweating when anticipating or undergoing dental treatment:

"I was very scared, and my anxiety increased, my hands were shaking and I was nervous." (Participant 10).

"I started having palpitations, shortness of breath." (Participant 02).

Dentists and mental health professionals recognized these as indicators of heightened anxiety arousal:

"They experienced palpitations, sweating and a rapid heartbeat..symptoms of physiological anxiety." (PSY03).

"When they sit on the chair, they will start shivering." (DR09, Group 2).

These responses align with diagnostic criteria for specific phobia, emphasizing the embodied nature of anxiety in dental contexts.

Theme 2: Sensory Sensitivity and Environmental Triggers.

Participants identified environmental stimuli, particularly auditory and olfactory inputs as powerful triggers of anxiety. Drill noises and chemical smells often elicited traumatic recall and exacerbated anxiety:

"The noise in the dental clinic also scares me." (Participant 02).

"I felt that this smell was overwhelming, making me feel suffocated. It is just very intense traumatizing." (Participant 16).

Dentists and psychologists confirmed these observations, noting that individuals with high anxiety sensitivity are particularly susceptible to environmental overload:

"The sounds they produce can be terrifying for some people." (PSY04).

"I would say the noise of the handpiece and the vibration are the main causes. Therefore, I ensure that I explain these two factors to patients before proceeding with treatment." (DR13, Group 3).

Theme 3: Childhood Dental Trauma and Emotional Encoding.

Many young adults traced their dental anxiety to early experiences involving pain, unkind clinicians and perceived helplessness:

"This anxiety began when I was 6 years old… it bled a lot." (Participant 14).

"The doctor was rude… my cheeks were swollen… made me fearful." (Participant 07).

These recollections, although sometimes vague, were emotionally salient and reflected conditioning processes involving pain, authority,

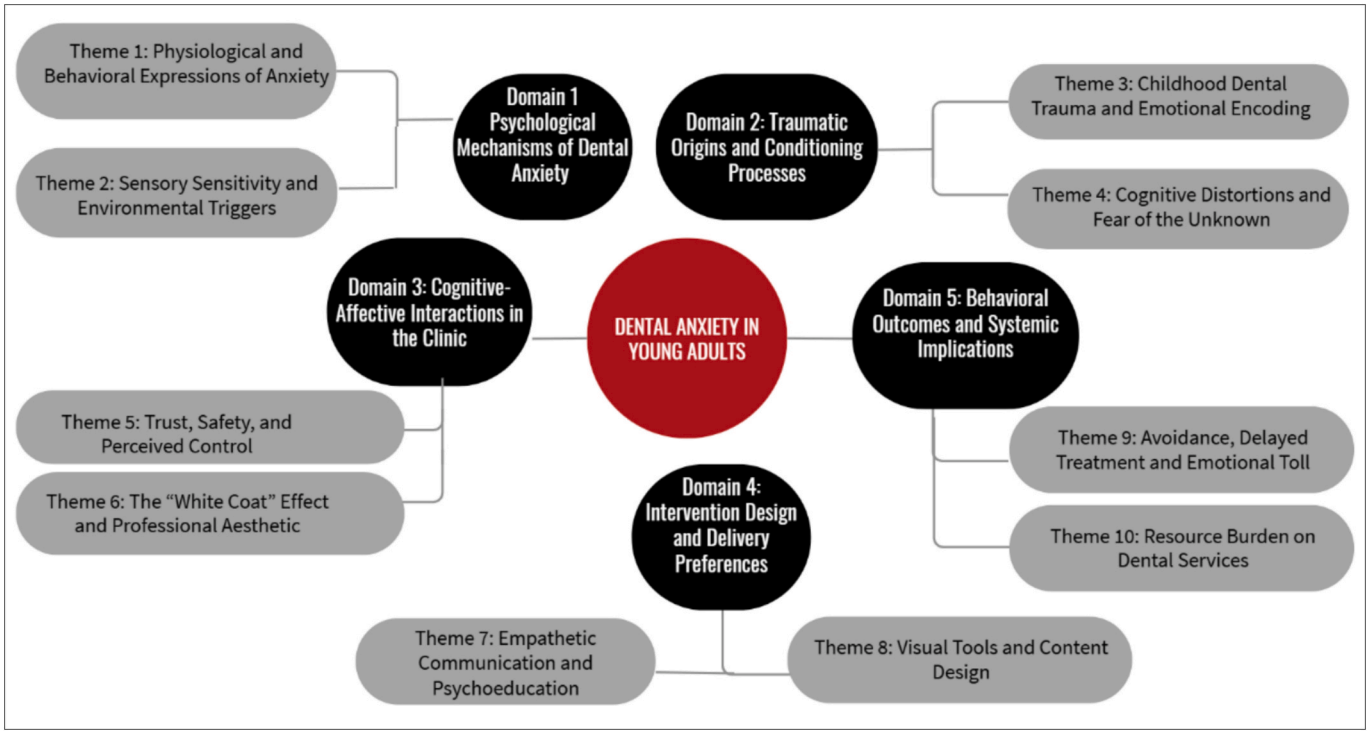

Fig. 3. Thematic map illustrating five core domains and ten themes underlying dental anxiety experiences among young adults from a multidisciplinary perspective.

and fear. Mental health professionals linked these to memory consolidation in the amygdala:

"It may be due to various factors, such as previous trauma, dental trauma, traumatic dental procedures in the past, possibly during childhood." (PSY02).

Theme 4: Cognitive Distortions and Fear of the Unknown.

The fear of "not knowing what will happen" emerged as a core cognitive trigger, consistent with uncertainty intolerance and catastrophic thinking:

It's a feeling of the unknown… what he or she will be going through. (DR08, Group 2).

Misinformation, lack of patient education, and limited prior exposure further reinforced these cognitive biases, contributing to anticipatory anxiety and procedural avoidance.

Theme 5: Trust, Safety, and Perceived Control.

Trust emerged as a pivotal moderator of anxiety. Young adults who experienced kindness, transparency and a sense of agency reported feeling more emotionally secure. Conversely, visible dental instruments, sharp tools and non-consensual procedures provoked defensive behaviors:

"Yes, we can see the sharp dental equipment used without being covered or hidden from us." (Participant 05).

Dentists and psychologists emphasized the importance of visual control, non-threatening language and collaborative care:

"We need to build trust with this group of patients". (DR10, Group 3).

"I believe in the health system; we have to work hand in hand with a multidisciplinary approach when preparing the patient,.. It would be good if they included us in this process". (PSY02).

Theme 6: The "White Coat" Effect and Professional Aesthetic.

The sight of clinicians in white coats was strongly associated with fear and hierarchy, particularly among participants with generalized anxiety traits:

"Yes, I was scared and nervous when I saw them all white. This made me afraid to come to the dental clinic again and increased my anxiety." (Participant 10).

In response, many dentists adopted informal attire and decorated clinics with non-medical colors or themes to ease anxiety:

"My white coat is like a colourful one. I create my own colourful white coat." (DR03).

Theme 7: Empathetic Communication and Psychoeducation

Young adults often felt unheard or judged, leading to social withdrawal and avoidance of care:

"I am usually less confident, resulting in not wanting to engage with dentists and being afraid of being judged." (Participant 12).

"The dentist did not communicate well, did not persuade or calm me down." (Participant 03).

Mental health professionals emphasized the need for empathetic listening, nonverbal cues and behavioral validation:

"People with barriers avoid interactions, fearing judgment." (PSY02).

Dentists acknowledged the role of tone, body language and verbal pacing in de-escalating anxiety:

"If we put on a stern expression, the patient's anxiety will escalate." (MOH04, Group 10).

Theme 8: Visual Tools and Content Design.

Audio-visual aids were well received, especially short, cartoon-based or animated content that distracted attention and reduced perceived threat:

"When I see the cartoon type, it makes me relaxed." (Participant 16).

Young adults preferred brief content, as longer videos were associated with boredom or overstimulation:

"If it is too long, it will cause boredom and palpitations." (Participant 10).

Mental health professionals cautioned against cognitive overload, reinforcing the utility of concise, structured material:

"The video *should be short because we want the patients to relax." (PSY01)*.

Theme 9: Avoidance, Delayed Treatment and Emotional Toll.

Participants described two main coping patterns: hypervigilant oral care to avoid the dentist, or complete avoidance, leading to worsening health and self-esteem:

"They won't come to us for routine checkups… only when there's a severe issue." (DR07, Group 2).

"Poor oral hygiene lowers self-esteem, leading to social withdrawal and anxiety." (PSY02).

Clinicians reported that high-anxiety patients often missed appointments or required special sessions:

"If anxiety increases, we must reschedule; it needs time and multiple appointments." (DR02).

Theme 10: Resource Burden on Dental Services.

Anxious patients required more time, flexibility, and specialized interventions, affecting service flow and resource allocation:

"We take our time slowly… step by step… and then we have to plan." (DR04).

"It requires a significant amount of time for patients with dental anxiety." (DR01).

Mental health professionals emphasized that early screening and psychological assessment could reduce systemic strain and improve adherence.

"If you don't detect it early, you'll face a patient who is hostile or non-cooperative." (PSY01).

Discussions

This study provides a clinically grounded exploration of dental anxiety among Malaysian young adults, revealing its psychological underpinnings, behavioral manifestations and systemic consequences. Anchored in perspectives from affected individuals, dental practitioners and mental health professionals, the findings reinforce dental anxiety as a multifactorial phenomenon encompassing features of specific phobia, anxiety sensitivity, trauma conditioning and cognitive-affective dysregulation. A prominent theme across narratives was the embodied expression of anxiety participants frequently described autonomic hyperarousal (e.g., palpitations, sweating, tremors), aligning with DSM-5 criteria for specific phobia and supported by prior work on anxiety biomarkers in dental settings [16]. Sensory triggers such as the sound of drills or the smell of disinfectants were described as emotionally overwhelming, consistent with heightened environmental threat perception and hypervigilance commonly observed in individuals with elevated trait anxiety [17,18].

Trauma-linked conditioning emerged as a core etiological pathway. Recollections of painful or distressing childhood dental procedures, often delivered by perceived authoritarian figures, mirrored established models of fear acquisition via classical conditioning and emotional encoding in the amygdala [19]. These findings echo earlier reports by Clow et al., and Rafatjou et al., that underscore the long-lasting psychological imprint of early adverse dental experiences [20,21]. Cognitively, participants exhibited features of intolerance of uncertainty, catastrophic thinking and learned helplessness, hallmarks of anxious cognitive style. The fear of "not knowing what will happen" intensified anticipatory anxiety and procedural avoidance, reflecting vulnerabilities in cognitive control and emotion regulation [22]. Notably, misinformation and inadequate psychoeducation further entrenched maladaptive beliefs, reinforcing avoidance patterns. Affectively, trust, empathy and perceived control emerged as critical moderators. Participants described how empathic clinician behavior, visual transparency (e.g., concealing sharp tools) and collaborative communication improved their emotional safety, key tenets in cognitive-behavioral therapy (CBT) and exposure-based interventions. Conversely, "white coat anxiety" evoked physiological reactivity, consistent with literature on medical environments as conditioned anxiety cues [23,24].

In terms of intervention preferences, participants favored brief, visually engaging and non-threatening materials, such as animated

videos and calming sensory inputs. These preferences reflect known mechanisms of attention modulation and distraction-based coping and resonate with cognitive load theory in anxiety management [25,26]. Importantly, interventions requiring minimal verbal engagement were particularly welcomed by socially avoidant individuals, aligning with insights on avoidance as a defensive strategy in high-anxiety populations [27]. Systemically, DA led to significant functional impairments, including delayed care-seeking, missed appointments and low treatment adherence. These patterns represent behavioral avoidance cycles and mirror psychiatric models of anxiety-related impairment [28,29]. Moreover, the need for longer consultation times and modified scheduling highlights the resource-intensiveness of treating high-anxiety patients, reinforcing the call for early identification using validated tools such as the MDAS and DASS-21 [30].

This study underscores the imperative for a trauma-informed, multidisciplinary approach to DA management. Mental health professionals advocated for proactive screening and co-developed interventions tailored to individual profiles. These recommendations align with integrative models of care in other anxiety disorders [31]. Integrating psychological screening into routine dental workflows, especially in high-risk groups, may prevent chronicity and reduce system-level burden. While this study offers robust triangulated insights, the sample though diverse may have excluded marginalized populations with limited healthcare access. Nonetheless, the combined use of FGD and IDI, NVivo-assisted thematic coding and interdisciplinary participant input enhances both depth and credibility.

Conclusion

This study explored dental anxiety among Malaysian young adults through multidisciplinary perspectives. Dental anxiety exhibited features consistent with specific phobia, including autonomic arousal, trauma-linked conditioning, sensory sensitivity and cognitive distortions. Avoidance behaviors and increased treatment burden were commonly reported. Key contributors included early negative experiences, fear of the unknown and reduced perceived control during care. To mitigate these effects, participants recommended early screening using tools like the MDAS, cognitive-behavioral strategies, sensory-adapted environments and brief psychoeducational tools. A trauma-informed, psychologically safe and collaborative care model is essential. Integrating mental health frameworks into dental settings can enhance treatment adherence, emotional safety and long-term oral health outcomes.

CRediT authorship contribution statement

Azizi Ab Malek: Writing – review & editing, Writing – original draft, Visualization, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Nawwal Alwani Mohd Radzi:** Writing – review & editing, Visualization, Validation, Supervision, Formal analysis, Conceptualization. **Muhd Firdaus Che Musa:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization.

Funding

This study did not receive any support from public, commercial, or not-for-profit sources.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We thank Dr. Suriya A/P Loganadan for her invaluable support in data collection, and we extend our gratitude to the government officials and all participants for their essential contributions.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmip.2025.100169.

References

[1] Anbari F, Elmi Z, Anbari F, Rezaeifar K. General anxiety and Dental Fear: is there a Relationship? JDMT 2019;8:190.
[2] Eitner S, Wichmann M, Paulsen A, Holst S. Dental anxiety – an epidemiological study on its clinical correlation and effects on oral health. J Oral Rehabil 2006;33:588–93.
[3] Hoffmann B, Erwood K, Ncomanzi S, Fischer V, O'Brien D, Lee A. Management strategies for adult patients with dental anxiety in the dental clinic: a systematic review. Aust Dent J 2022 Mar 1;67(1 Suppl):S3–.
[4] Murad MH, Ingle NA, Assery MK. Evaluating factors associated with fear and anxiety to dental treatment—A systematic review. J Fam Med Prim Care 2020;9:4530–5.
[5] Appukuttan DP. Priyanka K Cholan, Anupama Tadepalli, Sangeetha Subramanian. Evaluation of Dental Anxiety and its Influence on Dental Visiting Pattern among Young Adults in India: A Multicentre Cross Sectional Study 2017;7(6):393–400.
[6] Md Bohari NF, Kruger E, John J, Tennant M. Analysis of dental services distribution in Malaysia: a geographic information systems – based approach. Int Dent J 2019 Jun 1;69(3):223–9.
[7] Kheir OO, Ziada HM, Abubakr NH, Abdel-Rahman ME, Fadl SM, Ibrahim YE. Patient–dentist relationship and dental anxiety among young Sudanese adult patients. Int Dent J 2019 Feb 1;69(1):35–43.
[8] Mayer TMA de S, Maior GBS, da Costa NP, do Nascimento MG, Colares V. Effectiveness of a smartphone application on dental anxiety in adolescents: A randomized controlled trial. Int J Paediatr Dent. 2023 Jul 1;33(4):409–17.
[9] Costa LR, Bendo CB, Daher A, Heidari E, Rocha RS á., Moreira AP de SC, et al. A curriculum for behaviour and oral healthcare management for dentally anxious children—Recommendations from the Children Experiencing Dental Anxiety: Collaboration on Research and Education (CEDACORE). Int J Paediatr Dent. 2020 Sep 1;30(5):556–69.
[10] Gill P, Baillie J. Interviews and focus groups in qualitative research: an update for the digital age. Br Dent J 2018;225(7):668–72.
[11] Elangovan S, Guzman-Armstrong S, Marshall TA, Johnsen DC. Clinical decision making in the era of evidence-based dentistry. J Am Dent Assoc [Internet]. 2018;149(9):745–7. Available from: https://doi.org/10.1016/j.adaj.2018.06.001.
[12] Aarvik RS, Agdal ML, Svendsen EJ. Restraint in paediatric dentistry : a qualitative study to explore perspectives among public, non- specialist dentists in Norway. Acta Odontol Scand [Internet]. 2021;79(6):443–50. Available from: https://doi.org/10.1080/00016357.2021.1881159.
[13] Moore R, Brødsgaard I, Rosenberg N. The contribution of embarrassment to phobic dental anxiety: a qualitative research study [Internet]. Vol. 11. 2004. Available from: http://www.biomedcentral.com/1471-244X/4/10.
[14] Braun V, Clarke V. Using thematic analysis in psychology. Available from Qual Res Psychol [Internet] 2006;3(2):77–101. http://www.tandfonline.com/action/journalInformation?journalCode=uqrp20%5Cnhttp://www.tandfonline.com/action/journalInformation?journalCode=uqrp20.
[15] Williams-McBean CT. The value of a qualitative pilot study in a multi-phase mixed methods research. Qual Rep 2019;24(5):1055–64.
[16] Höglund M, Wårdh I, Shahnavaz S, Berterö C. Dental clinicians recognizing signs of dental anxiety: a grounded theory study. Acta Odontol Scand 2023;81(5):340–8.
[17] Karibe H, Koeda M, Aoyagi-Naka K, Kato Y, Tateno A, Suzuki H, et al. Differences in the perception of dental sounds: a preliminary study. Patient Prefer Adherence 2019;13:1051–6.
[18] Joy EE, Bartholomew TT. Clients in context: Environment, class, race, and therapists' perceptions of generalized anxiety disorder. J Clin Psychol 2021 Dec 1;77(12):2817–31.
[19] Dębiec J, Bush DEA, LeDoux JE. Noradrenergic enhancement of reconsolidation in the amygdala impairs extinction of conditioned fear in rats - a possible mechanism for the persistence of traumatic memories in PTSD. Depress Anxiety 2011 Mar;28(3):186–93.
[20] Clow J, Northstone K, Hardwick C, Dermont M, Dudding T. Are childhood oral health behaviours and experiences associated with dental anxiety in adolescence? Int J Paediatr Dent 2023;33:372–81.
[21] Rafatjou R, Ahmadpanah M, Ahmadi B, Mahmoodi M. Evaluation of Dental anxiety and the Role of Concomitant Factors in their anxiety Level in 9-12 years Old Children. Avicenna J Dent Res 2019 Jun 30;11(2):53–60.
[22] Lin CS, Lee CY, Chen LL, Wu LT, Yang SF, Wang TF. Magnification of fear and intention of avoidance in non-experienced versus experienced dental treatment in adults. BMC Oral Health [Internet]. 2021 Dec 1;21(1):1–9. Available from: https://doi.org/10.1186/s12903-021-01682-1.

[23] Leventhal H, Contrada RJ, Leventhal EA. Lessons From White Coat Hypertension: Comment on Spruill et al. "'The Impact of Perceived Hypertension Status on Anxiety and the White Coat Effect'" [Internet]. 2007. Available from: https://academic.oup.com/abm/article/34/1/10/4569348.
[24] Arslan I, Aydinoglu S. Child and parent preferences for the appearance of dentists with respect to personal protective equipment in paediatric dentistry. Int J Paediatr Dent 2022 Sep 1;32(5):702–13.
[25] Kirschner PA. Cognitive load theory: implications of cognitive load theory on the design of learning [Internet]. Vol. 12, Learning and Instruction. 2002. Available from: www.elsevier.com/locate/learninstruc.
[26] Gavric D, Cameron D, Waechter S, Moscovitch DA, McCabe RE, Rowa K. Just do something: an experimental investigation of brief interventions for reducing the negative impact of post-event processing in social anxiety disorder. J Anxiety Disord 2023 Aug;1:98.
[27] Duker LIS, Grager M, Giffin W, Hikita N, Polido JC. The Relationship between Dental Fear and anxiety, General Anxiety/Fear, Sensory Over-Responsivity and Oral Health Behaviors and Outcomes: a Conceptual Model. International Journal of Environmental Research and Public Health MDPI 2022;19.
[28] Arnaudova I, Kindt M, Fanselow M, Beckers T. Pathways towards the proliferation of avoidance in anxiety and implications for treatment. Behav Res Ther 2017 Sep;1(96):3–13.
[29] Cademartori MG, Karam SA, Chisini LA, Collares KF, Azevedo MS, Demarco FF, et al. Self-perceived oral health and happiness. Available from: Brazilian J Oral Sci [Internet] 2024 Sep;19(23):e249979. https://periodicos.sbu.unicamp.br/ojs/index.php/bjos/article/view/8669979.
[30] Muntingh ADT, De Heer EW, Van Marwijk HWJ, Adèr HJ, Van Balkom AJLM, Spinhoven P, et al. Screening high-risk patients and assisting in diagnosing anxiety in primary care: the Patient Health Questionnaire evaluated. BMC Psychiatry 2013 Jul;17:13.
[31] Phadraig, N Neeson, O Murdoch, B Daly. Training for dental professionals improves confidence in managing patients with dental anxiety in Ireland [Internet]. 2020. Available from: www.isdh.ie.