(RESEARCH ARTICLE)

Dental phobia: Prevalence and anxiety factors in the city of Mahajanga

Njarasoa Charlette Randriamalala [1, *], Hasina Menja Harivola Andriamanjato [2], Mariette Rakotoson [3], Haritiana Sergio Nicko Rabarijaona [4], Hasinjanahary Tsiriniaina Andrianjafinoro [1] and Juvence Ramaroson [1]

[1] Department of Conservative Odontology Endodontics, Institute of Tropical Odonto-Stomatology of Madagascar, University of Mahajanga, Madagascar.
[2] Psychiatry department, University Hospital, Tuléar, Madagascar.
[3] Department of Dentofacial orthopedics, Institute of Tropical Odonto-Stomatology of Madagascar, University of Mahajanga, Madagascar.
[4] Department of Dental prosthesis, Institute of Tropical Odonto-Stomatology of Madagascar, University of Mahajanga, Madagascar.

Abstract

Introduction: One of the obstacles to dental care in the general population is dental phobia. Fear of the dentist has a negative impact on oral health, as well as the course of dental care. The objective of this study is to determine the prevalence of dental phobias in the Mahajanga's population.

Method: This is a descriptive retrospective cross-sectional study, using the MDSA scale or modified Corah scale. A cluster survey was conducted to constitute the sample.

Results: The study population was 210, among them 57, 2% were women with a sex ratio of 0.73; the age of the study population ranged from 18 to 60 years old, 40% were in the age group of 18 to 35 years old. Age was significantly associated with the occurrence of dental phobia. Anxiogenic factors observed were: the noise of instruments (p = 0.000), anesthesia (p = 0.000) and fear of pain (p = 0.000).

Conclusion: This study has shown that dental phobia exists in our society. Improving communication between caregivers and the patient could improve care in the dental environment.

Keywords: Dental phobia; Prevalence; Anxiety factors; Mahajanga

1. Introduction

Oral health is essential for the general condition and quality of life [1]. However, in the dental office, fear, even phobia is regularly present and has a significant influence on the behavior of the patient.

Fear of the dentist can evolve into dental phobia or stomatophobia. These different terms encompass a disease recognized by the WHO, which is part of a specific phobia covering both the fear of dental damage and that felt towards the dental surgeon [2]. The fear of the dentist leads to a renunciation of dental care leading to a deterioration of the oral condition.

[*] Corresponding author: RANDRIAMALALA Njarasoa Charlette
Department of Conservative Odontology Endodontics, Institute of Tropical Odonto-Stomatology of Madagascar, University of Mahajanga, Madagascar.

In 2013, according to a study conducted by the Institute of study opinion and marketing in France and international (IFOP), the proportion of renunciation of dental care due to fear of the dentist was 29% [3]. In 2017, in America, the prevalence of dental phobia is estimated at 15% in adults [4]. In Madagascar, few studies have been done on this subject. The objective of this study was to assess the level of anxiety of the population in the city of Mahajanga.

2. Methods

The study was made in the city of Mahajanga located in the northwest coast of Madagascar. Mahajanga is home to the only dental school in the entire Big Island. According to a census carried out by the National Order of Odontostomatologists of Madagascar, eighty-five (85) Odontostomatologists practiced in the Boeny Region. This is a retrospective descriptive cross-sectional study. Were included in the study all the inhabitants of Mahajanga for 5 years, having an age greater than or equal to 18 years and not consulting a dental office during this period. Were excluded patients refusing to participate in the survey and having difficulties in answering the questionnaire. Sampling was done by cluster sampling. According to the Schwatz formula the sample size calculation being as follows.

$$n = \frac{E\alpha^2 x p x q x p}{i2}$$

To our knowledge, there are no exact local data indicating the frequency of patients with dental phobia. Assuming that the prevalence of dental phobia is unknown, we will then take the value of p = 0.5 which corresponds to the most unfavorable case, that is to say the largest dispersion, the calculation of the size of the sample necessary to make an inference on the population gives:

- $\varepsilon\alpha$: reduced deviation corresponding to a degree of confidence of 95% (1.96 ≈ 2 for risk of error α = 0.05)
- p: estimated proportion of the population with the observed trait = 0.5

$$1 - 0.5 = 0.5 \, x \, q = 1 - p$$

- i: desired precision = 0.10
- • g: this formula is associated with a correction coefficient for the cluster effect = 2.1 in the survey

$$n = \frac{4 x 0.5 x 0.5 x 2.1}{(0.10)2}$$

n = 210 inhabitants survey

The sample size is 210 inhabitants to be surveyed, we have 30 clusters

The number of inhabitants surveyed per cluster is = 210/30 or 7 inhabitants per cluster. The inhabitants per each cluster are drawn randomly. The cluster is made up of fokontany constituting the urban commune of Mahajanga

For the data collection mode and tools, pre-established, tested survey sheets were used. An interrogation is carried out to gather information.

MDSA scale or modified Corah scale was used to determine the patient's level of anxiety regarding dental care. It consists of five questions, and each question contains five possible answers. Each answer is scored from 1 to 5.

1 = not anxious

2 = slightly anxious

3 = quite anxious

4 = very anxious

5 = extremely anxious

The sum of all these answers will determine whether the patient is phobic or not:

A score < 13 means that the patient is not anxious, if the score is between 13 and 19 the anxiety is moderate, and if the score is greater than or equal to 19 we speak of extreme or even phobic anxiety compared the care dental.

Data were processed and analyzed with Statistical Package for the Sociological Science (SPSS) for Windows, version 20 (IBM SPSS Statistics 20.0).

From the beginning of the study, the consent of the participants is requested. The confidentiality of information, human rights, the rights to freedom of opinion, as well as the privacy of participants is respected.

The sincerity of the answers as well as the recollection constitutes the limits of the study.

3. Results

In this study population, 57.6% were women and 42.4% men. The sex ratio was 0.73; the age of the study population ranged from 18 to 60 years old, 40% were in the age group of 18 to 35 years old, 35.7% were in the age group of 35 to 55 years old and 24.3% were aged 55 and over.

According to modified Corah scale, 4.8% presented with dental phobia and 40.4% with anxiety (Table 1).

Table 1 Distribution of the population according to the prevalence of dental anxiety

Prevalence of dental anxiety	Effective	Proportion
Corah scale ≥19	10	4.8
13< Corah scale <19	85	40.4
Corah scale <13	115	54.8
Total	210	100

Regarding the variables associated with dental phobia. Women had higher dental phobia and anxiety than men (Table 2)

Table 2 Distribution of the sample according to gender and the determination of the new anxiety

Gender	Corah scale≥19	13< Corah scale<19	Corah scale<13	Total
	n (%)	n (%)	n (%)	n (%)
Male	3 (1.4)	31 (14.8)	55 (26.2)	89 (42.4)
Feminine	7 (3.3)	54 (25.7)	60 (28.6)	121 (57.6)
Total	10 (4.8)	85 (40.5)	115 (54.8)	210 (100)

Key: Number in parenthesis = proportion (%)

Table 3 Distribution of the sample according to age and level of anxiety

Age	Corah scale ≥19	13< Corah scale<19	Corah scale<13	Total	P
	n (%)	n (%)	n (%)	n (%)	
[18-35]	8 (3.8)	41 (19.5)	35 (16.7)	84 (40.0)	0.007
[35-55[	2 (1.0)	25 (11.9)	48 (22.9)	75 (35.7)	
>55	0 (0.0)	19 (9.0)	32 (15.2)	51 (24.3)	
Total	10 (4.8)	85 (40.5)	115 (54.8)	210 (100)	

A highly significant difference was observed between age and onset of dental phobia, in particular the age group from 18 to 34 years (Table 3)

Anxiogenic factors observed were: instrument noise (p=0.000), anesthesia (p=0.000) and fear of pain (p=0.000) (Table 4)

Table 4 Distribution of the sample according to anxiety factors and level of anxiety

Anxiety factors	Corah scale≥19 n (%)	13< Corah scale<19 n (%)	Corah scale<13 n %	Total n %	P
Instrument noise					
Weak	0 (0.0)	0 (0.0)	82 (39.0)	82 (39.0)	0.000
Moderate	0 (0.0)	73 (34.8)	1 (0.5)	74 (35.2)	
High	10 (4.8)	2 (1.0)	0 (0.0)	12 (5.7)	
Neutral	0 (0.0)	10 (4.8)	32 (15.2)	42 (20.0)	
Anesthesia					
Weak	0 (0.0)	14 (6.7)	83 (39.5)	97 (46.2)	0.000
Moderate	0 (0.0)	65 (31.0)	1 (0.5)	66 (31.4)	
high	10 (4.8)	1 (0.5)	5 (2.4)	16 (7.6)	
Neutral	0 (0.0)	5 (2.4)	26 (12.4)	31 (14.8)	
Fair of pain					
Weak	0 (0.0)	14 (6.7)	81 (38.6)	95 (45.2)	0.000
Moderate	0 (0.0)	67 (31.9)	2 (1.0)	69 (32.9)	
High	10 (4.8)	1 (0.5)	4 (1.9)	15 (7.1)	
Neutral	0 (0.0)	3 (1.4)	28 (13.3)	31 (14.8)	
Total	10 (4.8)	85 (40.5)	115 (54.8)	210 (100)	

4. Discussion

In this study, modified Corah scale (MDAS) was used to assess fear of dental care. The modified Corah scale has been widely used in its last decades [5] and has been reported to be both valid and reliable [6]. The use of MDAS offers various advantages such as simplicity, short execution time and the completion process does not increase respondent anxiety [7]. It also has good cross-cultural validity and has been translated into many languages [8]. Nevertheless, controversial studies for the use of a single rating scale.

Armfield in 2011 used 3 rating scales the SIDAF question by measuring emotional reaction; the DASde Corah scale describing the state of anxiety and fear stimuli as well as the dental anxiety and fear index; IDAF-4C to see the four distinct aspects of the dental fear response. [9]

Locker et al. [10] researched the associations and levels of agreement between the three dental fear scales, as well as the prevalence of dental fear obtained using the three scales, as a hypothesis the prevalence estimates were similar between the scales due to their strong association, however the use of different scales gave a different classification on the level of anxiety and dental fear.

Regarding the level of anxiety, in this study the prevalence of anxiety was 40.4%. This rate is high compared to that of the literature.

In 2011 in Australia, Armfield reported that the prevalence of dental anxiety ranged from 7.8% to 18.8% [9]. In India, Giri et al. mention an anxiety rate of 20.67% [11]. In Sudan in 2019, authors report a rate of 29.5% [12].

According to Armfield the prevalence of dental phobia is between 0.9% and 5.4% depending on the diagnostic criteria used to define the phobia. [13]. In this study, the prevalence was 4.8% in the Mahajanga's population. In Japan, Ogawa et al. report a rate of 2.2% according to the DAS score [14]. In India, Giri et al. mention a rate of 2% with a DAS score ≥ 19 [11]. On the other hand, in Sudan, researchers found a high rate compared to this study, i.e. 22.2% [12].

Regarding the social profile of phobic patients, this study agrees with that of the literature, highlighting that the level of anxiety is high in women compared to men. In Brazil, with the DAS scale of Corah, Dadalti et al report a statistically significant difference between gender and fear of dental care (22.9% versus 13.1%) [15]. According to Zinke et al., in a study carried out in Germany, in 2019, women are prone to signs of dental anxiety with higher scores than men [16]. Yet other studies dispute these results because men can also have higher level of anxiety than women [17-18].

In this study, patients between the age group 18 to 35 were the most affected (p=0.007). This result corroborates that of Zinke et al. These researchers report that young age is positively correlated with the onset of anxiety [16]. In Israel, Shacham et al., also reported that subjects aged 19 or over have a high risk of anxiety [19]. The experience lived by the patients as well as the control of emotion and the mastery of stressful situations could explain this phenomenon.

Dental care accounts for half of the medical care that patients forgo the most. This rate remained stable until 2012 (47.1% against 46% in 2000) [20-21].

According to an Institute for opinion and marketing studies in France and abroad (IFOP) study in 2013, fear is the third reason for refusing treatment with a rate of 29% in a population that has not consulted a dental office for 2 years [3]. In this study, the noise of the instrument, anesthesia and fear of pain were a high risk factor for the occurrence of fear of dental care.

Factors favoring a fear of the dentist could be a lack of communication between practitioner and patient, failure to respect the humanization of care as well as the subsequent experiences of the patient and the influence of the community [22].

5. Conclusion

This study showed that there are patients with dental phobia in Mahajanga despite the existence of the dental school in the city. The noise of the instrument, anesthesia and fear of pain were a risk factor for the occurrence of fear of dental care.

Raising awareness among the population must be carried out to mitigate this situation. Thus, a humanization of care could improve care in the dental environment. As a study perspective, a KAP study (Knowledge, Attitude, Practice) of the Mahajanga's population on dental phobia is envisaged.

Compliance with ethical standards

Acknowledgments

All individuals who participated in the study.

Disclosure of conflict of interest

No conflict of interest to declare.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1]   Amzalag A. The patient in all his states. In: Codes of the dentist-patient relationship.Masson. 2007. p. 3-17.

[2]   World Health Organization. Oral health Factsheet No. 318.2012. www.who.int

[3]   Institute for opinion and marketing studies in France and abroad (IFOP). The French their dentist and access to oral care : Sondage n°111 470 ; 2013

[4]   Seligman, L.D.; Hovey, J.D.; Chacon, K.; Ollendick, T.H. Dental anxiety: An understudied problem in youth. Clin. Psychol. Rev. 2017; 55: 25–40

[5]   Armfield JM. How do wemeasure dental anxiety and fear and what are we measuring anyway? OralHealthPrev Dent. 2010; 8 : 107–15.

[6]   Schuurs AHB, Hoogstraten J. Appraisal of dental anxiety and fear questionnaires: a review. Community Dent Oral Epidemiol. 1993; 21: 329–39.

[7]   Humphris, G.; Hull, P. Do dental anxiety questionnaires raise anxiety in dentally anxious adult patients? A two-wave panel study. Prim. Dent. Care. 2007; 14: 7–11.

[8]   Abu-Ghazaleh, S.B.; Rajab, L.D.; Sonbol, H.N.; Aljafari, A.K.; Elkarmi, R.F.; Humphris, G. The Arabic version of the modified dental anxiety scale. Psychometrics and normative data for 15-16 year olds. Saudi Med. J. 2011, 32, 725–729.

[9]   Armfield JM. A comparison of three continuous scales used to determine the prevalence of clinically significant dental fear. Community Dent Oral Epidemiol. 2011; 39: 554–563.

[10]   Locker D, Shapiro D, Liddell A. Whose dentally anxious? Concordance between measures of dental anxiety. Community Dent Oral Epidemiol.1996;24:346–50.

[11]   Giri, J.; Pokharel, P.R.; Gyawali, R.; Bhattarai, B. Translation and Validation of Modified Dental Anxiety Scale: The Nepali Version. International Scholarly Research Notices. 2017; 2017 : 5.

[12]   Kheir OO, Ziada HM, Abubakr NH, Abdel-Rahman ME, Fad SM and Ibrahim YE. Patient–dentist relationship and dental anxiety among young Sudanese adult patients. International Dental Journal. 2019; 69: 35–43.

[13]   Armfield JM. The extent and nature of dental fear and phobia in Australia. Australian Dental Journal. 2010; 55: 368–377.

[14]   Ogawa, M.; Sago, T.; Furukawa, H. The Reliability and Validity of the Japanese Version of the Modified Dental Anxiety Scale among Dental Outpatients. Sci. World J. 2020, 2020, 8734946.

[15]   Dadalti MTS, Cunha AJL, Souza TGD, Silva BA, Luiz RR, Risso PA. Anxiety about dental treatment – a gender issue. ActaOdontol. Latinoam. 2021 ; 34 (2) : 195-200

[16]   ZinkeA , Hannig C, Berth H. Psychological distress and anxiety compared amongst dental patients- results of a cross-sectional study in 1549 adults. BMC Oral Health. 2019 ; 19 -27

[17]   Dou L, Vanschaayk MM, Zhang Y, Fu X et al. The prevalence of dental anxiety and its association with pain and other variables among adult patients with irreversible pulpitis. BMC Oral Health. 2018; 18:101.

[18]   Ratson, T.; Blumer, S.; Peretz, B. Dental anxiety of parents in an Israeli kibbutz population and their prediction of their children's behavior in the dental office. J. Clin. Pediatr. Dent. 2016, 40, 306–3011

[19]   Shacham M, Greenblatt-KimronL, Humphris G, Ben-Ezra M and Mijiritsky E. Psychometric Properties of the Hebrew Modified Dental Anxiety Scale in Adult Israeli Population.Int. J. Environ. Res. Public Health. 2022 ; 19, 1499

[20]   Celant N, Guillaume S, Rochereau T. Survey on health and social protection 2012. IRDES reports n° 556, 2014.

[21]   Auvray L, Dumensil S, Le fur P. Survey on health and social protection 2000. IRDES reports n° 508, 2001.

[22]   Oosterink FMD, de Jongh A, Hoogstraten J. Prevalence of dental fear and phobia relative to other fear and phobia subtypes. Eur J Oral Sci. 2009;117:135–143