Original Article

Anxiety in Dental Patients

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ABSTRACT

Objective: To determine the frequency of self-reported anxiety levels related to dental procedures amongst dental patients using Revised Corah's Dental Anxiety Scale, (DAS-R).
Study Design: A cross sectional descriptive study
Place and Duration of Study: This study was carried out at the Medical, Dental and Allied Health Professionals' College from October 2010 and April 2011.
Materials and Methods: 485 patients comprised the study sample. All those patients who consented to participate and were 12-65 years of age were included. They were scored for anxiety using revised Corah's Dental Anxiety Scale (DAS-R).
Results: The mean DAS score for our study population was 9.91 (SD 3.29), while the modal score was 12. Based on the DAS Score, distribution of the respondents was: Non anxious - 63.1% (n=304); Anxious - 33.2% (n=160); and Phobic - 3.7% (n=18). Other findings are detailed subsequently. We found that self-reported-phobic levels were higher in males compared to females, while the DAS scores on the contrary were higher for females than males.
Conclusion: We found that DAS score were higher (more anxiety) in females than in males. Interestingly, we also found that self-reported dental phobia was observed more often in males than females.
Key Words: Anxiety, Dental Procedures, Revised Corah's Dental Anxiety Scale, (Das-R), Dental Phobia, Patients

INTRODUCTION

Anxiety to dental procedures is not uncommon.[1] It not only results in cancelling and delaying of dental appointments[2] but also leads to an experience of enhanced pain in an anxious patient.[3,4] Moreover, anxiety may lead to systemic complications.[5,6] Avoidance of dental treatment and management of anxious dental patients adds another paradigm of challenging issues that may have a negative effect on dental health[7] and at large, the general health. Studies from Europe[8,9] America[10] and Australia[11,12] have shown the presence of high levels of fear and anxiety in patients towards dental procedures. A Norwegian study reported anxiety scores (DAS ≥ 13) in 11.5% males and 23% females.[13] Avoidance behavior with resultant compromise to oral health eventually set up a vicious cycle which leads to exacerbation of fear for dental treatments and greater likelihood of avoidance of dental treatment leading to poorer dental outcomes. The transfer of this dental anxiety from one generation to the next, with resultant aggravation of the problem, raises further challenge.[14] Many stimuli related to dental settings can evoke dental anxiety.[15] Boyle, Newton and Milgrom have particularly addressed the issue of receiving injections and its relation to anxiety.16

When compared with ten other common fears, among Dutch adults Oosternik et al observed that dental fear was fourth in ranking.[17] Muppa and co-workers suggested that noise produced in the dental clinic setting was the third most important reason of ignoring a dental appointment.[18]

Evidence suggests that young females are more commonly afflicted with dental fear and anxiety than young males and that a reduction in these issues was noted with advancement of age of those affected.[19]

In a study conducted at Isfahan University on children's dental fear, the parents blamed traumatic dental experiences amongst other external factors, as the cause.[20] Cases with dental fear require careful management to alleviate anxiety.[21]

To manage dental anxiety, the logical first step is to measure its burden. An objective study is needed to assess dental anxiety, beyond subjective perception of individual clinicians and using pre-validated tools. Corah's Revised-Dental Anxiety Score test, commonly known as DAS, is a well-recognized, widely used, and pre-validated tool for assessment of dental anxiety and phobia.

It has also shown high internal consistency[22,23] and test-retest reliability.[24]

To our knowledge, no literature was available on prevalence of dental anxiety in Pakistan until 2011 when a short communication was published. It highlighted a study conducted in Islamabad, Rawalpindi and Multan. We conducted our study to determine the frequency of dental anxiety in the patients presenting to dental OPDs at two centers, one each in Karachi and Hyderabad.

MATERIALS AND METHODS

Self –responding questionnaires were administered in this cross sectional study to a convenient sample of about 550 patients of Jinnah Medical and Dental College, Karachi, and, Isra University, Hyderabad. We

received back 503 questionnaires. Of these questionnaires, 18 were rejected due to invalid responses. The remaining 485 were used for data analysis. This data was collected as part of a larger study, conducted from 2010 to 2011.

Norman Corah's Revised Dental Anxiety Scale questions were used as part of the questionnaire. This scale utilizes four questions, with five options grading anxiety from 'not anxious' (score 1) to 'extreme anxiety' (score 5). Each question depicts a dentally related scenario. The maximum possible score being 20, these scores are used to measure an individual's anxiety levels. Score 12 or less is considered non anxious, higher than 12 indicates the presence of anxiety,[25,26,27] and above 15 suggests dental phobia which indicates that patients with these scores may require extra help.[28]

Inclusion and exclusion criteria: The only two inclusion criteria were to be a patient of above mentioned dental OPDs and belonging to the age group 12 to 65 years. The exclusion criteria were, to not consent to participate in the study and not fulfilling inclusion criteria.

Sampling technique: The selection was a convenient sample of all patients from the stated OPDs. We distributed 550 questionnaires. Out of these, 503 questionnaires could be recollected and the study was continued with 485 valid responses, after data editing. Unanswered questions in any of the section were excluded from data analysis and the statistics that followed.

Data analysis: SPSS version 19 was used to perform statistical derivations.

RESULTS

The age of the respondents ranged between 12 and 65 years, with mean age of 27.22 years (SD 10.09). Of these 48.49% were males and 51.51% were females.

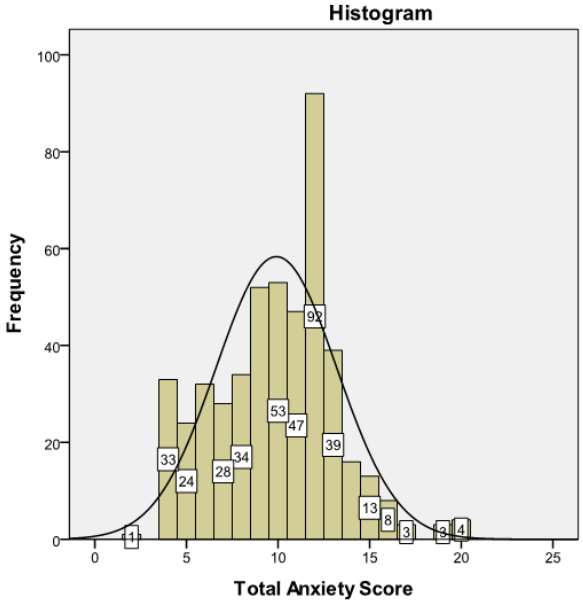
Close ended, direct questions for anxiety assessment were asked. The response options were ordinal, from no anxiety at all to a high level of anxiety manifesting physical signs. The analyzed data for the four questions is summarized in Table I and Graph 3. While the table is self-explanatory, the graph shows another aspect. The level of anxiety is consistently increasing with each situation closing into the dental procedure, expressed by question from 1 to 3. However, by the time of Q4, there is an overall decrease in anxiety, which is still more than that as a day ahead of going to the clinic, but least of all the three situations within the clinic.

The mean DAS score for our study population was 9.91 (SD 3.29), while the modal score was 12. Based on the DAS Score, distribution of the respondents was: Non anxious - 63.1% (n=304); Anxious - 33.2% (n=160); and Phobic - 3.7% (n=18). (Graph I)

When results were analyzed based on gender the mean DAS Score for females was 10.32 (SD 3.34) and modal score was 12. Distribution of the respondents was: Non-anxious 53.8% (n= 128); Anxious 42.0% (n= 100); and Phobic 4.2% (n= 10). On the other hand, mean DAS score for males was 9.47 (SD 3.17) and modal score was 10. Distribution of respondents was: Non-anxious 72.3% (n= 162); Anxious 25.0% (n = 56) and Phobic 2.7% (n= 06). (Graph II). Based on the above comparison and cross tabulation through Pearson Chi-Squared test, we found that in our study population, the difference between male and female anxiety levels was highly significant ($p < 0.001$).

Table No.I: Data summary of the anxiety assessment

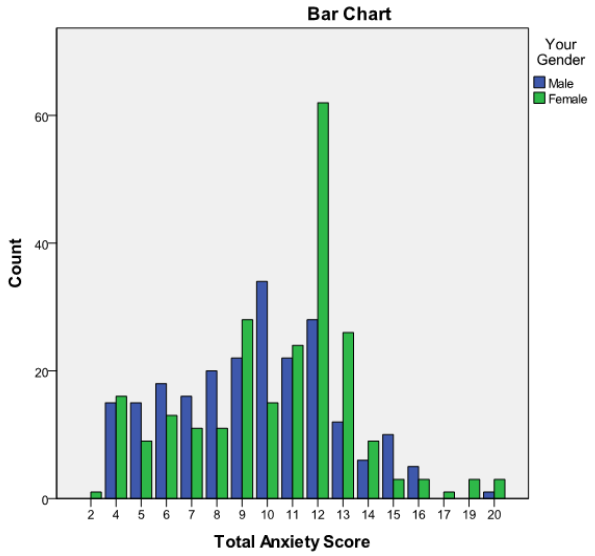
	Q. 1.		Q. 2.		Q. 3.		Q. 4.	
	N	**%**	**N**	**%**	**n**	**%**	**n**	**%**
Relaxed	175	36.2	114	23.6	74	15.4	141	29.3
A little uneasy	122	25.3	94	19.4	117	24.4	112	23.3
Tense	136	28.2	166	34.3	183	38.1	155	32.2
Anxious	37	7.7	80	16.5	76	15.8	44	9.1
So anxious that I sometimes break out in a sweat or almost feel physically sick	13	2.7	30	6.2	30	6.3	29	6.0
Invalid or missing responses (excluded from analysis)	2		1		5		4	



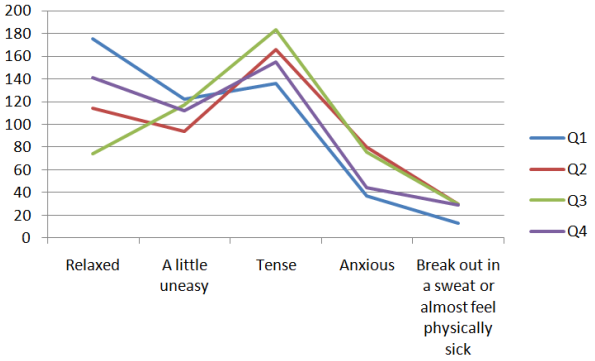
Graph No.I: A histogram of total anxiety score (0-20), of the study subjects

It is also interesting to note that while the objectively calculated DAS score in males was lower than that in females, the *subjectively* reported 'dental phobia' was higher in males than in females.

The standard DAS questions were preceded by some other questions. They included questions about (a) whether or not the respondents considered themselves as 'dental phobics' (where dental phobia was defined as the level of anxiety that interferes with getting the dental treatment done); b) How did their dental phobia start; c) The age at the start of dental phobia; d) Who were they comfortable talking to, when feeling concerned. Dental phobia was self-declared by 59.34% of the respondents. The Pearson Chi Squared test results showed that there was a statistically significant ($p < 0.03$) relationship between gender and 'dental phobia'.



Graph No.2: A bar chart of total anxiety score (0-20), of the study subjects (gender-based)



Graph No.3: Summary of anxiety assessment

The reported mean age of onset of dental phobia was 17.4 years (SD 8.76). Responding to how their dental phobia started, 45.67% of the respondents thought that they had a bad experience, 20.13% of the patients blamed a family member's bad experience as the reason for dental anxiety and 34.20% of the respondents did not have any clue as to what caused this dental phobia. No statistically significant difference could be found in the number of the respondents of the two genders for the ways dental phobia started. Responding to their preference for whom to talk to when they had a dental concern, 39.58% of the respondents felt comfortable talking to the dentist, 38.54% to the dental assistant and 17.71% to the receptionist. The rest, 4.17%, were not comfortable sharing their concerns with any of the above.

DISCUSSION

Anxiety is a multisystem response to a perceived threat or danger. Dental phobia is a more extreme form of dental anxiety. It is therefore not uncommon for patients who have dental anxiety to delay dental treatment and in some cases, avoid it altogether.[29.30] Moreover, of the anxious patients who do present for treatment, demonstrate low compliance and hence, compromise their dental treatment.[31]

Negative experience in the past, lack of control over the situation, unpredictable nature of dental treatment and a feeling of danger, have all been blamed for dental fear and anxiety. However, negative 'perceptions' about dental treatment were more likely to result in anxiety and fear than negative 'experiences'.[32] Parental fear and anxiety has a direct relationship with child's fear and anxiety, more pronounced in children below eight years of age. This implies that anxiety and fear may be communicated from the parent to the offspring, increasing the seriousness of the problem.[33,34] Cultural background, psycho-social factors and an individual's unique circumstances are also thought to be related to an individual's anxiety.[35,36]

Age of onset of dental anxiety has received relatively less research interest so far. Theories surrounding the relationship between age of onset of dental anxiety (or fear) and its results towards seeking dental care have seen both ends of the spectrum. Locker and colleagues are of the view that an individual with a negative dental experience is likely to be anxious towards dental procedures irrespective of the age at which anxiety was first noticed. The authors also suggested that family history was related to child-onset anxiety only, while adult onset anxiety indicates issues with trait and psychiatric problems.[37] In contrast to this, Poulton and colleagues suggest that these depend on the different conditioning experiences they have had.[38] In our study the age of onset of anxiety ranged between 02 and 60 years with mean age of 17.4 years (SD 8.76) and in most cases related to a bad experience, by one's self (45.67%) or a family member (20.13%).

Literature is over-whelming with suggestions that females are more commonly afflicted with dental anxiety than males.[39] A Brazilian study regarding prevalence and predictors of anxiety showed that two out of every eight individuals were suffering from moderate to severe anxiety. It also found that females were more severely afflicted with the anxiety issue during dental treatment than males.[40] A similar

Brazilian research done on adolescents found that 18% manifested moderate to severe anxiety towards dental treatment and that females were more commonly affected.[41] Our study result was also aligned to the above international finding that the average DAS score for females was higher than that for males and this difference was statistically significant.

A Norwegian study observed 25-year old, randomly selected individuals, grouped in 2 separate cohorts of 1997 and 2007. Their findings were also suggestive of the fact that females (23%) have a higher prevalence of dental anxiety than males (11%).**Error! Bookmark not defined.** Another observation in the same study was that rising education level from 1997 to 2007 had reduced the anxiety level in the latter cohort.

CONCLUSION

We found that the R-DAS scores based on self-reported anxiety levels related to dental procedures, were higher in females compared to males and the difference was statistically significant. We also found that conversely, self-reported-phobic levels were higher in males compared to females.

REFERENCES

1. Karst M, Winterhalter M, Munte S, et al. Auricular acupuncture for dental anxiety: A randomized controlled trial Anesth Analg 2007; 104: 295-300.
2. Shaikh MA, Kamal A. Over dental anxiety problems among university students: Perspective from Pakistan. J Coll Physicians Surg Pak 2011; 21(4):237-8
3. Weisensee W, Scheer M, Muller L, et al. Impact of anxiety parameters on prospective and experienced pain intensity in implant surgery. Implant Dentistry 2012;21:502-506.
4. Eli I, Schwartz-Arad D, Baht R, Ben-Tuvim H. Effect of anxiety on the experience of pain in implant insertion. Clin Oral Implants Res 2003;14: 115-118.
5. Fardal O, McCulloch CA. Impact of anxiety on pain perception associated with periodontal and implant surgery in a private practice. J Periodontol 2012;83:1079-1085.
6. Okawa K, Ichinohe T, Kaneko Y. Anxiety may enhance pain during dental treatment. Bull Tokyo Dent Coll 2005; 46 (3):51-58.
7. McGrath C, Bedi R. The association between dental anxiety and oral health-related quality of life in Britain. Comm Dent and Oral Epidemiol 32 (1), 67-72.
8. Pohjola V, Lahti S, Vehkalahti MM, Tolvanen M, Hausen H. Association between dental fear and dental attendance among adults in Finland. Acta Odontol Scand 2007;65:224-30.
9. Enkling N, Marwinski G, Jöhren P. Dental anxiety in a representative sample of residents of a large German city. Clin Oral Investig 2006;10(1):84-91.
10. Rayman S, Dincer E, Almas K. Managing dental fear and anxiety. N Y State Dent J 2013;79(6): 25-9.
11. Armfield JM, Slade GD, Spencer AJ. Dental fear and adult oral health in Australia. Community Dent Oral Epidemiol 2009;37(3):220-30.
12. Armfield JM, Stewart JF, Spencer AJ. The vicious cycle of dental fear: exploring the interplay between oral health, service utilization and dental fear. BMC Oral Health 2007;7:1.
13. Åstrøm AN, Skaret E, Haugejorden O. Dental anxiety and dental attendance among 25-year-olds in Norway: time trends from 1997 to 2007. BMC Oral Health 2011;11:10
14. Nuttall NM, Gilbert A, Morris J. Children's dental anxiety in the United Kingdom in 2003. Dentist 2008;36 (11):857-860.
15. Vermaire JH, Ad De Jongh, Irene H, Aartman A. Dental anxiety and quality of life: the effect of dental treatment. Community Dent and Oral Epidemiol 2008;36 (5):409–416.
16. Milgrom P, Newton JT, Boyle C, Heaton LJ, Donaldson N. The effects of dental anxiety and irregular attendance on referral for dental treatment under sedation within the National Health Service in London. Community Dent Oral Epidemiol 2010; 38:453–459.
17. Oosterink FM, de Jongh A, Hoogstraten J. Prevalence of dental fear and phobia relative to other fear and phobia subtypes. Eur J Oral Sci 2009;117(2):135-43.
18. Muppa R, Bhupatiraju P, Duddu M, Penumatsa NV, Dandempally A, Panthula P. Comparison of anxiety levels associated with noise in the dental clinic among children of age group 6-15 years. Noise Health 2013;15:190-3.
19. Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. Int J Paediatr Dent 2007;17(6):391-406.
20. Jafarzadeh M, Keshani F, Ghazavi Z, Keshani F. Reviewing the parental standpoint about origin of the dental fear in children referred to dentistry centers of Isfahan University of Medical Sciences. Iran J Nurs Midwifery Res 2011; 16(1):133–139.
21. Armfield JM, Heaton LJ. Management of fear and anxiety in the dental clinic: A review. Aust Dent J 2013;58(4):390-407.
22. Facco E, Zanette G, Manani G. Italian version of Corah's Dental Anxiety Scale: Normative data in patients undergoing oral surgery and relationship with the ASA physical status classification. Anesth Prog 2008;55:109–115.

23. Eli I, Baht R, Kozlovsky A, Simon H. Effect of gender on acute pain prediction and memory in periodontal surgery. Eur J Oral Sci 2000;108: 99–103.
24. Halvari A, Halvari H, Bjørnebekk G. Motivation and anxiety for dental treatment: Testing a self-determination theory model of oral self-care behaviour and dental clinic attendance. Motiv Emot 2010; 34:15–33
25. Sohn W, Ismail AI. Regular dental visits and dental anxiety in an adult dentate population. J Am Dent Assoc 2005;136:58–66.
26. Ekanayake L, Dharmawardena D. Dental anxiety in patients seeking care at the University Dental Hospital in Sri Lanka. Community Dent Health 2003;20:112–116.
27. Bedi R, McGrath C. Factors associated with dental anxiety among older people in Britain. Gerodontol 2000;17:97–103.
28. Newton JT, Buck DJ. Anxiety and pain measures in dentistry: a guide to their quality and application. J Am Dent Assoc 2000;131:1449–57.
29. Skaret E, Raadal M, Berg E, Kvale G. Dental anxiety and dental avoidance among 12-18-year olds in Norway. Eur J Oral Sci 1999;107:422–8.
30. Hägglin C, Hakeberg M, Ahlqwist M, Sullivan M, Berggren U. Factors associated with dental anxiety and attendance in middle-aged and elderly women. Community Dent Oral Epidemiol 2000;28:451–60.
31. Scheutz F, Heidmann J. Determinants of utilization of dental services among 20- to 34-year-old Danes. Acta Odontol Scand 2001;59:201–11.
32. Armfield JM. Towards a better understanding of dental anxiety and fear: cognitions vs. experiences. Eur J Oral Sci 2010;118: 259–264.
33. Themessl-Huber M, Freeman R, Humphris G, MacGillivray S, Terzi N. Empirical evidence of the relationship between parental and child dental fear: a structured review and meta-analysis. Int J Paediatr Dent 2010;20(2):83-101.
34. Lahti S, Luoto A. Significant relationship between parental and child dental fear. Evid Based Dent 2010;11(3):77.
35. Berggren U, Pierce CJ, Eli I. Characteristics of adult dentally fearful individuals. A cross-cultural study. Eur J Oral Sci 2000;108:268–74.
36. Hittner JB, Hemmo R. Psychosocial predictors of dental anxiety. J Health Psychol 2009;14:53–9.
37. Locker D, Liddell A, Dempster L,Shapiro D. Age of Onset of Dental Anxiety. JDR 1999;78(3): 790-96.
38. Poulton R, Karen EW, Thomson WM, Locker D. Determinants of early- vs late-onset dental fear in a longitudinal-epidemiological study. Behaviour Research and Therapy 2001;39:777–85.
39. Schuller AA, Willumsen T, Holst D. Are there differences in oral health and oral health behavior between individuals with high and low dental fear? Comm Dent Oral Epidemiol 2003;31:116–21.
40. de Carvalho RW, Wathson F, et al. Anxiety regarding dental treatment: prevalence and predictors among Brazilians. Ciênc. Saúde Coletiva 2012;17(7):1915-1922.
41. de Carvalho RW, de Carvalho Bezerra Falcão PG, de Luna Campos GJ, de Souza Andrade ES, do Egito Vasconcelos BC, da Silva Pereira MA. Prevalence and predictive factors of dental anxiety in Brazilian adolescents. J Dent Child (Chic) 2013; 80(1):41-6.

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