

Evaluation of dental anxiety among children visiting Paediatric Dental Department at Children Hospital

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Abstract

Objective: To determine efficacy of the Urdu version of Dental Subscale of Children's Fear Survey Schedule on children for identifying children with dental anxiety.

Methods: This cross-sectional study was conducted at the Children's Hospital, Lahore, Pakistan, in November 2015, and comprised child patients who were selected using convenient sampling. Dental Subscale of Children's Fear Survey Schedule was translated into Urdu using forward-backward translation method and administered to subjects aged 4-14 years to evaluate its psychometric properties and set a cut-off score for identifying fearful children. Factor analysis technique evaluated the translated items and analysis of variance explored age-anxiety linkage.

Results: Of the 204 participants, 89(43.6%) were girls and 115(56.4%) were boys. The survey yielded a normal distribution on anxiety scale, with a mean score of 32.13 ± 12.06 and high reliability ($\alpha=0.934$). Factor analysis indicated 3 factor pattern similar to Western findings. Items about 'choking, drilling sound and open-your-mouth' were mostly feared. Anxiety score declined with age. Setting cut-off score at 70th percentile patients having anxiety score of ≥ 43 were labelled as fearful, and those below as not fearful.

Conclusion: The scale was deemed valid and reliable tool.

Keywords: Behavioural management techniques, Dental fear, Reliability. (JPMA 67: 1532; 2017)

Introduction

Medical problems have their behavioural aspects which bear on treatment in terms of feelings and emotions such as dental fear. Fear is an unpleasant feeling about something perceived as harmful.¹ Dental anxiety is a naturally developed emotion in childhood and may lead to avoidance of dental care and disruptive behaviour during treatment. Dental anxiety can result in disturbed sleep, negative thoughts and fright response.²

Fear-fighting behavioural modification techniques such as psychotherapy, systematic desensitisation, reinforcement and relaxation techniques have been used, however, research studies carried out in different countries indicate that cultural and social factors such as social class factors, parenting style and previous harsh dental experiences may partly account for dental anxiety in children.³ In short, fear has been found as significantly associated with irregular use of dental services. Research literature reveals inconsistent findings about gender differences in dental anxiety, however, dental fear was found to decline with age in nearly all the studies, as children mature.⁴⁻⁶

A questionnaire used in Europe and Latin America both by

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clinicians and researchers alike is the Children's Fear Survey Schedule-Dental Subscale (CFSS-DS).⁷ The present study used CFSS-DS for the first time on paediatric dental patients to make available a dental fear questionnaire in Urdu to the paediatric dentists in Pakistan. This study was planned to assess reliability and validity of Urdu version of CFSS-DS and determine its cut-off score for differentiating fearful children from those who were not fearful. A secondary objective was to explore if demographic factors such as age and gender of the child as well as parents' level of education can impact dental anxiety in Pakistani culture.

Patients and Methods

This cross-sectional study was conducted at the Children's Hospital, Lahore, Pakistan, in November 2015, and comprised child patients who were selected using convenient sampling.

The patients were surveyed by means of Urdu version of CFSS-DS.⁷ It has 15 brief markers that cover different aspects of dental situation; 'having to open your mouth, having somebody put instruments in your mouth', etc. Respondents indicate their responses on five-point scale; very much afraid (5) to not afraid (1). Responses on all items are summated to denote child's dental fear index. The scale was translated into Urdu by forward translation method by a committee of three native dentists and then back-translated into English by another three dentists who were blind to the original

text to assess the equivalence of the Urdu text with the source text. Resultantly, minor amendments were made in the Urdu version in the light of this exercise. The Urdu version was then piloted on 35 dental children. It was found that children could easily comprehend items and answer them.

The Urdu CFSS-DS was administered to the patients with the consent of their parents after they were done with the dentist on their medical appointment. Questions of CFSS-DS were read out one by one to each child from the script and the child's response to each item was recorded by the dentist. Information about the parent's education and income was obtained from the accompanying parent/guardian. Since factor analysis requires 10 participants/responses per item,⁸ 150 persons were needed for 15-item scale. Approval was obtained by the institutional ethics committee.

Results

Of the 204 participants, 89(43.6%) were girls and 115(56.4%) were boys. Besides, 71(34.8%) children were in the age range of 4-8 years, 72(35.3%) in the range of 9-11 and 61(29.9%) in the range of 12-14 years. On clinical examination, 108(53%) children were found to have caries, 37(18%) had tooth retention/restoration problems, 12(6%) had orthodontic problems, 10(5%) had extraction, 10(5%) gingivitis/ calculus, 8(4%) delayed eruption, 8(4%) had poor oral hygiene-related issues and 11(5%) had other problems.

Since no difference was found in the mean scores of boys and girls, the data was combined to find overall statistics.

Dental fear scores were found to be normally distributed (skewness = 0.888, kurtosis = 0.166) with mean at 32.30 ± 12.06 . Children of different age groups were seen to have significantly different mean scores (Table-1).

One-way analysis of variance (ANOVA) revealed that mean anxiety score differed significantly across the three age groups ($p < 0.03$). The mean anxiety score between extreme age groups 1 and 3 was significantly different showing that fear declined after 11 years of age. Certain items on the questionnaire were found to be more age-sensitive and fear-reflective than others, such as: no. 5 'having someone put instruments in my mouth', 6 'chocking', 8 'people with white uniform', 9 'doctor', 10 'having dentist clean your mouth', 12 'dentist', 13 'the sign of drilling', and 15 'the dentist drilling you'.

The dental scale bore high reliability ($\alpha = 0.934$). The corrected item-total correlation was also high (.588 - .802). Confirmatory factor analysis with orthogonal (varimax) rotation yielded a 3-factor solution, explaining 67% of the variance in scores. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was highly satisfactory for this analysis (0.912, $p < 0.001$). Bartlett's test of sphericity was also highly significant ($p < 0.001$). Factor-I tapped initial triggers of anxiety such as 'having someone examine your mouth'. Factor-II seemed to be about fear of less invasive procedures, such as 'having to go to the hospital or having dentist clean your mouth', and Factor III characterised fear of highly invasive procedures such as 'dentist drilling you'. Every item clearly loaded on one of the three factors and met the criterion of factor loading of > 0.50 . Reliability

Table-1: Anxiety score of different groups of children by age, sex and number of visits to hospital.

Groups	Age in years	N	M(SD)	Statistic
Age				
1	4-7	71	34.47(± 13.50)	
2	8-10	72	32.79(± 13.61)	
3	11-14	61	28.63(± 10.83)	
				F = 3.53, p < .031
Gender				
1	Boys	115	32.33(± 13.27)	
2	Girls	89	31.88(± 12.64)	
				t = 0.241, p < .588
Visit				
	1st	130	31.96(± 12.68)	
	2nd	45	32.75(± 14.03)	
	3rd	28	31.75(± 13.18)	
				F = 0.073, p < .929
ALL		204	32.30(± 12.06)	

Note. LSD comparisons were significant ($p = .05$) for mean scores of age-groups 1 and 3 only.

LSD: Least significant difference.

M: Mean

SD: Standard deviation.

Table-2: Rotated Varimax Factor Structure and Item-Analysis for Urdu CFSS-DS on 204 children.

CFSS-SD Items	Factor-I Initial Triggers	Factor-II Less Invasive procedures	Factor-III Invasive procedures	Corrected item-total correlation
1 having someone look at you	0.829	0.138	0.288	0.637
2 having a stranger touch you	0.824	0.268	0.143	0.672
3 having to open your mouth	0.753	0.445	0.23	0.793
4 having someone examine your mouth	0.720	0.409	0.315	0.802
5 having someone put instruments in your mouth	0.547	0.417	0.401	0.749
6 chocking	0.327	0.224	0.573	0.588
7 having to go to hospital	0.423	0.571	0.209	0.659
8 people with white uniform	0.329	0.750	0.139	0.674
9 doctor	0.312	0.721	0.269	0.716
10 having dentist clean your mouth	0.166	0.636	0.296	0.591
11 injection	0.287	0.500	0.34	0.607
12 dentist	0.162	0.725	0.346	0.675
13 the sign of dentist drilling	0.205	0.272	0.803	0.672
14 the noise of drilling	0.22	0.289	0.822	0.701
15 dentist drilling you	0.154	0.256	0.828	0.638
Rotated SS Loading				
Eigan values	3.492	3.492	3.18	
% of variance	23.281	23.277	21.197	
Cumulative %of variance	23.18	46.558	67.755	
Alpha (α)	0.907	0.846	0.861	

Note. Items in bold face load under respective factor.

CFSS-DS: Dental Subscale of Children's Fear Survey Schedule.

Table-3: CFSS-DS score and proposed cut-off for Non-Fearful and Fearful Children.

Percentile Score	CFSS-DS score	Anxiety levels
10	15	
20	21	Not-Fearful ≤ 25
30	24	
40	26	
50	29	Moderately-Fearful 26-42
60	33	
70	37	
80	43	
90	55	Highly-Fearful ≥ 43
99	70	

CFSS-DS: Dental Subscale of Children's Fear Survey Schedule.

estimates for set of variables in each factor were high i.e. 0.907, 0.846, and 0.861 for factor I, II, and III (Table-2).

To find potential determiners of anxiety in our context and people, regression analysis was run entering gender, mother's education, father's education and child's age as antecedent variables. Regressing these on fear score showed that age ($\beta = -0.198$, $p < 0.004$) and father's education ($\beta = -0.228$, $p < 0.005$) significantly determined anxiety score such that younger age of the child and lower level of father's education influenced the odds of increasing dental fear. Further, cut-off score was

determined on this scale to distinguish fearful child from the non-fearful in our population such that children with a score of ≤ 25 were classified as non-fearful and those scoring 26-42 as moderately fearful in comparison to those with ≥ 43 score as fearful. These cut off scores were statistically set at 30th and 70th percentile points, respectively (Table-3).

Discussion

Responses on the fear questionnaire were examined in clinical settings in order to determine the efficacy of the scale in real-life situations. The mean dental fear score arrived in this study was closer to some of the previous studies: India 30.66, Singapore 30.60, Croatia 35.72 and Canada; 27.17.^{5,6,9,10} Also, in keeping with other studies, dental fear mean score did not differ between boys and girls. The fear score declined with increasing age probably due to physical and emotional maturity and socialisation.^{6,11}

Dental fear is a complex phenomenon and variation in dental fear score is influenced by age, sex, socio-cultural factors, previous dental experience and personality.⁴ In this study father's education and child's age emerged as significant predictors of children's dental anxiety. In fact, every country needs to have its own normative data

unique to local conditions and socio-cultural factors to interpret fear score of their child patients.

To apply this scale, a cut-off score was set on the local response-base of the children at percentile point 70th which is equal to score of ≥ 43 identifying top 30 per cent from the rest as fearful children. Those with 42-26 score can be called moderately fearful and those with just 25 or below as not-fearful children. Dentists can distinctly identify the fearful children and manage their treatment plans accordingly. Further, they may also glean over dental children's responses to individual items of the dental questionnaire to identify specific objects / procedures an individual child is highly afraid of, such as fear of drilling, to handle such fearful patients.¹² A step-wise, gradual exposure to the drill machine, for instance, can help the child become familiar with the sounds or feeling to drilling, tapering off child's fear. In other words, fear-behaviour management techniques in tandem with graduated dental treatment would help manage children's dental anxiety and yield better health outcomes.¹³

There is a large amount of evidence that supports the validity of the Urdu version of the scale for use in Pakistan. First, the alpha coefficient is high enough to warrant use of the scale on dental children ($\alpha = 0.934$). Second, the evidence on factor analysis shows a factor pattern similar to the results found in other countries¹⁴ and it qualifies Thakur's remarks that CFSS-DS is a 'gold standard' measure of child dental anxiety and can be effectively used to differentiate between patients with high and low dental fear.⁶ Third, there is evidence to confirm that anxiety score declined with age on Pakistani children as well in keeping with the findings across nations and countries.^{5,6}

Conclusion

Urdu version of CFSS-DS was found to be reliable, valid as well as gender fair. Patients anxious about dental procedures are often more difficult to treat and therefore need to be identified first. Knowledge of patients' level of dental anxiety can guide the dentist to devise treatment plan aligned with behavioural /pharmacological measure that reduce or overcome

dental fear and provide for better dental intervention. Researchers may explore the scale with a larger sample to arrive at generalisable results.

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References

1. Negra MJ, Oliveira M, Bendo C, Paiva S, Vale M. Determining cut off points for dental fear survey. *The Scientific World J* 2015; 2015: Article ID 983564
2. Cohen SM, Fiske J, Newton JT. Behavioral dentistry: The impact of dental anxiety on daily living. *Br Dent J* 2000; 18: 385-90.
3. Malik AR, Bokhari SA, Suhail AM, Imran MF, Hamza SA. Dental anxiety among patients attending a periodontal clinic: A cross sectional analysis. *J Pak Dent Assoc* 2014; 23:112-6.
4. Nakai Y, Hirakawa N, Milgram P. The Children's fear survey Schedule-Dental sub-scale. *Commun Dent Oral Epidemiol* 2005; 33:196-204
5. Raj S, Agarwal M, Aradhyak K, Kondr S, Nagakishore V. Evaluation of dental fear in children during dental visit using Children Fear Survey Schedule-Dental Subscale. *Int J Clin Pediatr Dent* 2013; 6: 12-5.
6. Thakur P, Sharma KR, Thakur S, Singhal P, Chauhan D, Jayam C, et al. Do parents understand the dental fear in their children? : Evaluation using CFSS-DS. *J Adv Med Dent Scie Res* 2015; 3: 29-33.
7. Cuthbert MI, Melamed BG. A screening device: children at risk for dental fears and management problems. *ASDC J Dent Child* 1982; 49: 432-6.
8. Tabuchnick BG, Fidell LS. *Using Multivariate Statistics*. 6th ed. Pearson, 2007.
9. Chellappah NK, Vignehsa H, Milgrom P, Lam LG. Prevalence of Dental anxiety and fear in children in Singapore. *Commun Dent Oral Epidemiol* 1990; 18: 269-71.
10. Majstorovic M, Veerkamp JS, Skrinjaric I. Reliability and validity of measures used in assessing dental anxiety in 5-15 years old Croatian children. *Eur J Pediatr Dent* 2003; 4:197-202.
11. Shaikh MA, Kawal A. Over dental anxiety problems among university students: perspectives from Pakistan. *J Coll Physicians Surg Pak* 2011; 21: 237-8.
12. Hakim K, Rajak IA. Dental Fear among Medical and Dental Undergraduates. *ScientificWorldJournal*.2014;2014:747508.
13. Gordon D, Heimberg RG, Tellez M, Ismail AI. A critical review of approaches to the treatment of dental anxiety in adults. *J Anxiety Disord* 2013; 27: 365-78.
14. Ten Berge M, Hoogstraten J, VeerkampJS, PrinsPJ. The Dental Subscale of Children's Fear Survey Schedule: A factor analytic study in the Netherland. *Commun Dent Oral Epidemiol* 1998; 26: 340-43.