

A novel Chotta Bheem–Chutki scale for dental anxiety determination in children

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Abstract

Objective: A potential problem in patient management in pediatric dentistry is dental anxiety among children. It is of paramount importance for pediatric dentists to identify an anxious child and review potential management options specific to every child. The aim of this study is to validate a newly devised Chotta Bheem–Chutki (CBC) pictorial scale and to compare this with Venham’s pictorial scale (VPS) and facial image scale (FIS) to measure dental anxiety in young children during their first dental visit. **Materials and Methods:** One hundred children aged 4–12 years were randomly selected from our hospital outpatient department. Child’s anxiety levels were measured using three different scales; the VPS, FIS, and the newly devised CBC pictorial scale. The scores were recorded by asking the children to choose the figure they identified with at that instant. The scores obtained from all the three scales were compared using student’s *t*-test. Pearson correlation test was used to obtain correlation among the scales used in the study. **Results:** A strong correlation (0.778) was found between FIS and CBC scale. Moreover, a strong correlation (0.811) was found between VPS and CBC scale, indicating good validity of the CBC scale. Seventy five percent of the children found CBC scale to be the easiest among the three scales. **Conclusion:** The findings of this study suggest that CBC scale can be used as a new tool for dental anxiety assessment in children.

Key words: Anxiety assessment scales, Chotta Bheem Chutki scale, child dental anxiety, first dental visit

INTRODUCTION

Despite the evolving trends in dentistry, anxiety and feeling of fear still persists for dental treatment in general population, especially in children and adolescents. Previous research has shown a prevalence of approximately 6–20%, irrespective of culture and country.^[1,2] Several terminologies have been used by various schools of psychological thought to unfold the concept of dental anxiety and fear in children. Anxiety is

a state of uneasiness or distress regarding something with a feeling of uncertain outcome. There are various views over the origin of this trait; it is not only concerned with the fear of pain or other incursive procedures but is also linked to the fear of separation from the parents and communicating with unknown people. Dental anxiety is defined as “an abnormal fear or dread of visiting the dentist for preventive care or therapy and unwarranted anxiety over dental procedures.”^[3-6]

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Dental anxiety in children is a matter of concern for pedodontists as the first dental visit leaves an impact and influences the future behavior toward dental treatment. Moreover, the effects of dental anxiety can last till adulthood, which can lead to dental neglect.^[7] Thus, it is of prime importance for a pediatric dentist not only to recognize dental anxiety but also adopt techniques to manage the child in such a manner that it incorporates a positive attitude in the child for future dental visits.

Various methods have been used in literature for the assessment of dental anxiety. Physiological methods such as measuring pulse rate, muscle tension, and blood pressure require experience in interpreting results from special equipment; projective techniques such as Corah's dental anxiety survey and modified Corah's dental anxiety survey require dexterity for carrying out interviews and scoring.^[7,8] Other easier methods to record anxiety include self-reporting questionnaires. The ideal measure to record anxiety should require less skill and should be easy to record. It should allow for limited cognitive and linguistic skills.^[8] In order to meet the abovementioned criteria, picture tests are the appropriate choice. Venham's pictorial test (VPT) and facial index scale (FIS) have been used in numerous studies to assess dental anxiety before dental treatment; however, these scales present with certain drawbacks such as figures on the VPT scale are all male which might pose difficulties when a young patient is a girl. In addition, the ambiguous nature of some figures on the scale are confusing for the child to choose, thus making it a time consuming procedure.^[7,9,10] Moreover, the figures used in these scales are not familiar for the children.

Hence, taking into account the aforementioned limitations, the present study was conducted to validate a newly devised pictorial scale Chotta Bheem–Chutki scale (CBC scale), with cartoon characters that are familiar for the children, and compare it with the VPT and FIS for the assessment of child's dental anxiety during their first dental visit.

MATERIALS AND METHODS

The sample size for the present study was calculated using the formula: $n = 4PQ/L^2$ [$P = 6.3\%$ (as per previous studies); $Q = 100 - P$, $L = 5\%$].

The present study was conducted among the first 100 children aged 4–12 years visiting the outpatient department (OPD) of the Department of Pedodontics, Sri Guru Ram Das Institute of Dental Sciences and

Research, Amritsar, during the period of May–July 2015 (3 months). The children were selected randomly based on the inclusion and exclusion criteria. Children and their parents/guardians visiting the OPD in the department were approached in the waiting area and were enquired if their children had any previous dental visits.

Inclusion criteria

- Children with no history of major illness
- First dental visit
- Accompanied by the parent or guardian.

Exclusion criteria

- Physically and mentally challenged children
- Children with history of previous dental visit.

Parents/guardians were informed regarding the study and consents were obtained from them. The study was started after taking ethical clearance by the ethical committee of the institute.

Three different scales were used to determine the anxiety level of children during their first dental visit.

Facial image scale

This scale comprises a series of five pictures showing very happy to very unhappy faces. For the study, the scale was shown to children and they were asked to choose the image they identified with at that instant. The scores were recorded by assigning a value of one to the very happy face and five to the very unhappy face [Figure 1].^[9]

Venham's pictorial test

This scale comprises eight cards with two figures on each, depicting one anxious and one nonanxious figure. The children were shown all the cards in an ordered sequence and were instructed to choose the image they closely identified with at that point. A score of one was recorded on choosing an anxious figure and zero was recorded if the child chose a nonanxious figure. The total score was added to obtain a final score out of eight [Figure 2].^[6]

Chotta Bheem–Chutki scale

This is a newly designed scale developed in the Department of Pedodontics, Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar. This scale comprises two separate cards; one for boys and the other for girls. For boys, Chotta Bheem cartoon character was chosen to depict various emotions, and for girls, Chutki

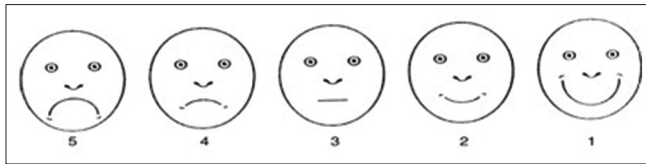


Figure 1: Facial image scale

cartoon character was chosen to depict various emotions. Each card consists of a series of six figures depicting happy to unhappy and running emotion by the cartoon character. Children were asked to choose the face they identified with at that instant. To record on the scale, a score of one was assigned to a happy face and six to an unhappy face and running [Figure 3].

RESULTS

One hundred children (aged 4–12 years) reporting to the Department of Pedodontics, Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar, during their first dental visit were randomly selected for this study. Among 100 children, 61 were boys and 39 were girls. The mean age of boys and girls was found to be 8.95 ± 2.54 years and 8.36 ± 1.90 years, respectively, and the difference was not significant statistically ($P = 0.215$) [Table 1].

Anxiety scores

The mean anxiety scores of males and females in CBC, VPT, and FIS were tabulated. No statistical difference of mean anxiety scores was noted between males and females in any of the anxiety rating scales [Table 2].

Correlation of Chotta Bheem–Chutki with Venham's pictorial test and facial index scale

The relevance of a psychometric instrument may be determined by its degree of correlation with other psychometric instruments that measure the same phenomenon. Pearson correlation test was performed to evaluate the correlation between CBC and VPT and CBC and FIS. A strong correlation was found between CBC and VPT ($r = 0.811, P < 0.001; n = 97$) as well as between CBC and FIS scores ($r = 0.778; P < 0.001; n = 100$). Thus, these results show that CBC can measure anxiety in the same manner as VPT and FIS [Table 3].

Facile test

Children were also asked to choose the anxiety scale which they found easy to understand and liked the most. 75% of children found CBC to be the easiest scale

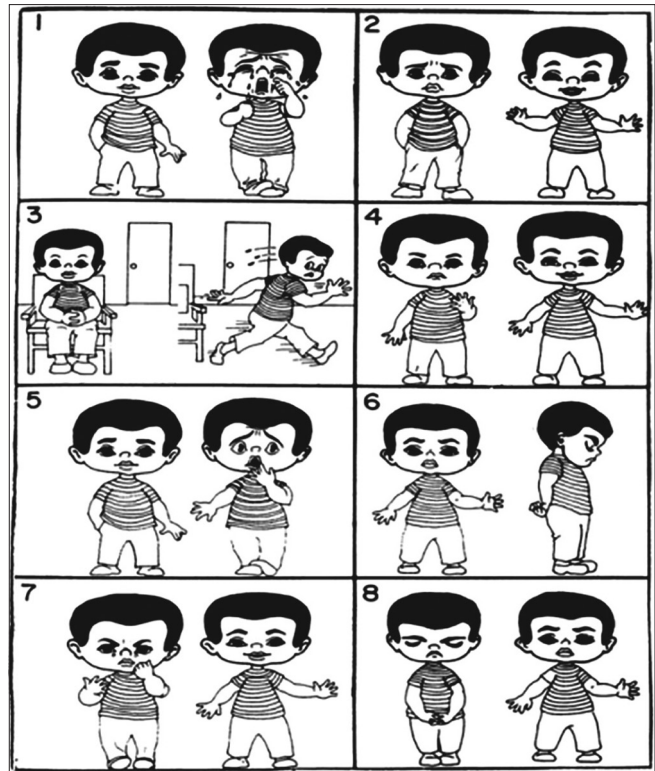


Figure 2: Venham's pictorial test

Table 1: Distribution of samples by age and sex

Sex	No. of subjects	Age (years) (mean±SD)	Significance	
			t-value	P-value
Male	61	8.95±2.54	1.249	0.215 NS
Female	39	8.36±1.90		
Total	100	8.72±2.32		

NS=Non-significant

Table 2: Comparison of mean anxiety scores

Scale	Sex	No. of subjects	Mean±SD	Significance	
				t-value	P-value
FIS	Male	61	2.54±1.13	0.735	0.464 NS
	Female	39	2.72±1.23		
VPT	Male	59	3.88±2.63	0.025	0.980 NS
	Female	38	3.89±2.50		
CBC	Male	61	2.48±1.64	0.122	0.903 NS
	Female	39	2.44±1.48		

NS=Non-significant, FIS=Facial image scale, VPT=Venham picture test, CBC=Chotta Bheem–Chutki scale

Table 3: Correlation between anxiety rating scales

Correlation	Number of subjects	Pearson correlation (r)	P-value
FIS with VPT	97	0.839	<0.001**
FIS with CBC	100	0.778	<0.001**
VPT with CBC	97	0.811	<0.001**

**Highly significant. FIS=Facial image scale, VPT=Venham picture test, CBC=Chotta Bheem

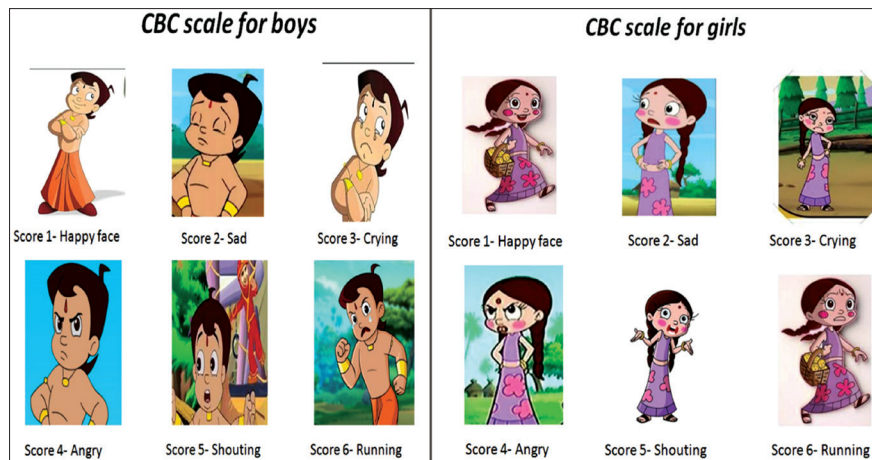


Figure 3: Chotta Bheem- Chutki scale

and preferred it over VPT and FIS. Only 8% of children found VPT easier than CBC scale. 17% of children found FIS to be the easiest scale.

DISCUSSION

Anxiety is usually the most likely response to dental stimuli and is most commonly seen in children during their first dental visit. Therefore, it is important for the dentists to identify the severity of anxiety in children using an acceptable technique to measure it. An anxious child in a dental clinic poses a problem not only for the child himself but also for his family. In addition, outcomes associated with poor oral health may be grave.^[11-13] Unpleasant dental experiences occur more frequently in anxious and recalcitrant children as opposed to nonanxious pediatric patients.^[14] Dental anxiety is found in 5–20% of the population. It is exhibited more in children. With increasing age, this dental anxiety shows a downward trend.^[11] Chhabra *et al.*^[15] in their study found prevalence of dental anxiety in Indian children aged 5–10 years to be 6.3%.

When looking into the utility of an assessment measure, three important factors should be considered:

- Validity of the instrument must be taken into account
- It must be suitable for use with pediatric patients
- The assessment measure should be of practical use in dental practice.

Thus, an ideal measure should be valid, simple, short in length, easily administered, attention grabbing for the child, and easy to measure. In order to fulfil the abovementioned criteria, choosing picture tests for assessment of anxiety is appropriate.^[10]

In this study, the FIS and VPT were used for assessing the reliability of the CBC scale by comparing them as these scales are intended to measure the state of anxiety in young children and have been used in numerous studies. Moreover, these are pictorial scales and have been used prior to the treatment.

The CBC scale does fulfil the prerequisites mentioned above, as is suggested by the outcomes of this study. This can be summarized as follows: A strong correlation of CBC with FIS and VPT scales validates it in dental clinic setting. CBC measured anxiety better than VPT and FIS, which is likely because, in VPT, figures on the cards are very similar to each other and are very confusing. Moreover, all the figures in VPT are those of males, which may have caused problems for young girl patients to identify their state of dental anxiety. In FIS, young children misinterpret the facial expressions on the scale.

Two children in this study were not able to choose and understand the VPT scale and were excluded from the study. VPT and FIS scores also show a strong correlation, as is demonstrated in this study, and collaborate with other studies.

In this study, no significant differences between the anxiety scores were seen between boys and girls. Similar findings were observed in other studies.^[7,16-18] In contrast to the abovementioned finding, other studies have shown higher anxiety levels among female children.^[19-22]

Because very young children lack the cognitive ability, indirect behavior measures are the only real alternatives as compared to the projective methods

such as Corah's dental anxiety survey.^[5] CBC is rapid and easy to administer, and is simply a reflection of the figure chosen. Moreover, children are familiar with the cartoon characters used in the scale and therefore relate to it. Furthermore, when child patients were asked which scale was the simplest and easiest to understand, majority of them chose the CBC scale.

The significance of any dental anxiety assessment tool in children is to provide a measure by which the dentist may judge the ability of the child to correspond to the treatment. CBC scale gives immediate "state" feedback to the dentist and allows to design appropriate treatment plans and behavior management in children. In addition, CBC scale has a potential to measure not only the degree of negativity but also how positive the child feels.

Limitations

- Small study sample
- Cartoon characters used are not universally acceptable.

Further studies involving older participants and use of cartoon characters that are universally known and familiar with children are required for more favorable results.

CONCLUSION

This study pointed out that the CBC scale yielded comparable results to the VPT and FIS. Its simplicity and familiar figures put into limelight its establishment as a benchmark to assess the level of dental anxiety faced by young children. Hence, the CBC scale can be used as a new alternative for dental anxiety assessment in young children.

Advantages of CBC scale

- Colourful and attractive
- Characters from ongoing famous cartoon series
- Separate cards for boys and girls
- Takes very short time.

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Conflicts of interest

There are no conflicts of interest.

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