The effect of psychological management on dental anxiety in children

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The aim of this study was to determine the effect of using of psychological management techniques on the level of anxiety in Nigerian children during dental management. The Short Form of the Dental Anxiety Survey Schedule was administered to 81 children who were attending a suburban dental clinic for the first time. This schedule was re-administered again two weeks later when they came for a follow up visit. The age of the patients was recorded. The types as well as number of psychological techniques employed during treatment were also noted. The overall mean dental anxiety level of the children decrease from an average of 15.23±5.03 before treatment to 13.40+4.13 after treatment ($p < 0.001$). However, the mean dental anxiety score in children in whom no psychological technique was employed during treatment increased after treatment. On the other hand, there was also a statistically significant decrease in the mean dental anxiety level of children treated using either a single psychological technique or combined psychological techniques after treatment. Better results were obtained when combined psychological techniques where used than when only a single technique was used. It was concluded that psychological techniques used in the management of dental anxiety in children are highly effective in decreasing dental anxiety levels. Better results are obtained when a number of techniques are combined effectively.

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INTRODUCTION

Dental anxiety is a worldwide problem and a barrier to oral health care services. This necessitates the need to manage dental anxiety in children because of the vicious cycle that may arise from unmanaged cases. One of this is the deteriorating dental health that arises as a complication of the anxiety. This exposes them to invasive dental procedures, which may be unpleasant and further reinforce fears for dental procedures.[1] Also, the anxiety may persist into adulthood and some of these children could grow up to become parents with dental anxiety, which they pass on to their children.

Methods of managing dental behavior of children are aimed at avoiding unpleasant and unproductive confrontations and to create an environment that would facilitate the ability of the child to ultimately accept care, protect the self esteem of the child and to foster a positive attitude towards oral care for the child. Moreover, it enhances the work quality and efficiency of the dental personnel.[2]

There are various techniques used in the management of anxiety of the patient. A number are directed at preventing the development of dental anxiety, while others are used in its treatment. Prevention of dental anxiety development in children often entails the effective use of psychological management techniques, which is aimed at enhancing trust, the lack of which can exacerbate anxiety. It also helps to enhance the feeling of control and the development of coping skills in patients.[3] This starts from the very first contact the patient makes with the dental environment,[4,5] which should be such that encourages the patient to be relaxed and promote easy interaction between the child and the dental team.

Other psychological management techniques aimed at getting the child to relax include the use of audio-visual products. This exposes the child to tape-slide scenes before the first dental examination with the product giving an explanation about a first dental visit so that the child may not view the appointment, dentist and dental staff as a serious threat.[4,6]

During treatment, other forms of psychological management techniques are used to prevent the

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development of anxiety. This includes the use of one of the old techniques, which is still much talked about today and encouraged. This is the "Tell-Show-Do" technique developed by Addelston in 1959.[7] It entails giving the child a very careful explanation of a procedure and equipment before the procedure is done and the equipment used.

The need to demonstrate the use of an instrument before the actual procedure so that the child may understand what is been said. For example, running a prophy cap on operator's thumb nail would be a 'do' type of activity.[6] Hoist and Ek[9] study reported that the use of this method throughout dental treatment for children in general dentistry resulted in an increase in positive acceptance of all treatment steps encountered and the time spent per child diminished compared with the period before the approach was introduced.[10]

There is the modeling technique of behavior modification. Here, the child-patient learns about dental experience by viewing other children receiving dental treatment. It involves either live or filmed models and has been used in several investigations and reported to be effective in preventing anxiety development.[10-15]

Distraction is also a psychological strategy in helping people cope with brief stressors. This skill is almost unteachable. It entails skillful communication with the dentist talking in a stream fashion with the aim of diverting the attention of the patient from noxious stimuli and to manipulate the perceptions and expectations of the child. It is very useful in children with a short attention span.[2] This points to the need for the dentist to develop good communication skills.[19]

Physical contact in the form of patting and stroking, also tended to be effective in reducing anxiety that may accompany dental care.[3,20] However, a touch given without accompanying verbal statements can be perceived as threatening or unfriendly[21] especially amongst children from low income families.[22] This may be because these low income children live lives that may be more frequently characterized by instability and insecurity. They may be sensitized to strangers, who may be less benign than those encountered by high income children.[22]

There is also a place for letting the child hold toys, mirror, etc. during treatment, permitting the child to raise a hand, press a buzzer and so forth to stop treatment. Allowing parents stay with the child in the operatory especially when they help to get the patient to be relaxed in the new environment as part of this technique.[23] A technique found to be effective in preventing dental anxiety developing in a child, who has a potential to do so is the use of positive reinforcement. Here, the child is praised and given gifts when he shows acts of cooperation. The child is further encouraged to continue to cooperate by coaxing, petting and use of persuasion when the child shows signs of poor cooperation.[19,24]

A variation to the above is the desensitization technique. This technique is effective for children, who have developed dental anxiety. It entails gradual exposure of the child to dental treatments for short periods of time starting from the non-invasive procedures such as simple polishing. The dentist only moves up to the next grade of treatment when the child has become comfortable with a level of treatment. This way, the child is gradually helped to confront whatever is the source of dental anxiety and thereby, overcome it. It is a time consuming technique, but very rewarding as the child eventually becomes comfortable with dental procedures.[7]

Psychological management of dental anxiety is encouraged in all normal children with cooperative ability. For resource-poor African countries, where capital intensive projects such as the purchase of relative analgesia machines or trained personnel experienced in the safe use of pharmacological agents for management of dental anxiety are scarce, the need to be conversant in the use of psychological techniques in managing the dentally anxious child becomes imperative.

This paper aimed at evaluating the effect of employed psychological management strategies on dental anxiety in children, who are attending a suburban African dental hospital and thus make appropriate recommendation of its use in African children.

MATERIALS AND METHODS

The study was conducted at the Paediatric Dental Unit of the Dental Hospital in the Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) lle-lfe, Nigeria. The unit provides tertiary dental health services in South Western Nigeria, for an estimated population of over 9.2 million people of which 40-45% are children.[25]

All consecutive new patients between the ages of eight and thirteen years and who were attending a dental clinic for the first time over an eleven month period were considered eligible for inclusion in the study population. Those with past medical history of major mental disorder or present physical disorder were excluded from the study. Ethical clearance was received from the institution for the study to be conducted. Also, verbal consent was received from the parents of the children, who participated in the study after the purpose of the study was explained to them.

A Short Form of the Dental Subscale of the Child Fear Survey schedule (DFSS-SF) described by Carson and Freeman[26] was administered to the children. This scale was completed, while the children were in the waiting hall on the first day of attendance and before any form of dental procedure was performed. The psychometric scale requires the children to rate dental anxiety on a 5 point scale from 1, corresponding to "no fear," to 5, corresponding to "very frightened," in relation to eight dental treatment situations. The questions included range from "meeting the dentist" to

"having teeth extracted". This questionnaire assesses the level of anxiety before treatment.

All patients were thereafter, managed by dentists. During treatment, the number and types of psychological management strategy employed for each child was recorded.

All the patients were then recalled two weeks after the initial dental management. The DFSS-SF was re-administered during this second visit. The re-evaluation was done to assess the dental anxiety level of the patients after receiving some form of dental treatment.

The professional status of the dentist-operator was also recorded. The use of psychological techniques per professional status was analyzed.

The pre-treatment and post-treatment anxiety score of the patients were entered into a desktop computer using Epi info version 6 software and was analyzed using SPSS (for Windows) version 6. The data obtained from the children on the first and second visits were compared using t-test. Also compared where the dental anxiety level changes when no psychological techniques was employed, when only one technique was employed and when more than one technique was employed. A statistical significance was regarded to exist where the p-value was less than 0.05.

RESULTS

Eighty-one children were recruited for the study during the period of data collection. Their mean age was 10.98 years (SD=1.73).

The mean value of the anxiety level of the children before treatment was 15.225±5.029.

The various types of psychological techniques used during treatment were the "Tell-Show-Do" in 67 (82.72%) child patient and positive reinforcement and coaxing in 16 (19.75%) child patients. Also distraction was used in 0.1(1.23%) patient, physical contact in 3 (4 children, permitting the child to raise hand to stop treatment in 6 (7.41%) children and spending time with the child outside the operatory before the commencement of treatment in 1 (1.23%) child. Restraint was used in 2 (2.47%) children. (see Table I).

In ten (12.3%) children, no form of psychological technique was employed during treatment, while in 47(58.1%), a single psychological technique was used. In 24 (29.6%) children, two or more techniques were used in combination simultaneously (see Table II).

The most common technique used when only a single psychological technique was employed during the dental treatment of the child was the "Tell-Show-Do" technique. This was employed in 44 (93.6%) of the 47 children. Positive reinforcement and coaxing was employed in 2 (4.3%) of the children, while the child was permitted to raise hand to stop treatment in 1 (2.1%) child.

The mean anxiety score of the children after treatment was found to decrease from an average of 15.23±5.03 to 13.40±4.13. This difference was found to be highly significant ($p < 0.001$) meaning that the anxiety of the child-subject decreased significantly between the pre-treatment and the post treatment.

Also, analysis of the mean dental anxiety score of the children (see Table II) showed that there was an increase in the mean anxiety score increased in children in which no technique was employed during treatment though this was not found statistically significant ($p = 0.22$). However, there was a statistically significant decrease in the mean anxiety level of children treated using a single psychological technique ($p = 0.00001$) and in those managed using combined psychological technique ($p = 0.0002$).

Table I. Number of times the technique was used during patient management

Tell-Show-Do	Positive Reinforcement And Coaxing	Physical Contact	Distraction	Permit The Child To Raise Hand To Stop Treatment	Spend Time With The Child Outside The Operatory	Restraint
67 (82.72%)	16 (19.75%)	3 (4.94%)	1 (1.23%)	6 (7.14%)	1 (1.23%)	2 (2.47%)

Table II. Mean of dental anxiety levels per number of techniques used

	No technique Employed during Treatment	single technique Employed during Treatment	Combined techniques Employed during Treatment
Pre treatment anxiety level	15.4	14.96	16.54
Post treatment anxiety level	16.5	12.85	13.92
Number of Patients	10	47	24

Table III. Analysis technique used

	No technique	%	Single technique	%	Combine technique	%
No. Children	10	100	47	100	24	100
No. Children With increased Dental Anxiety score	6	60.0	12	25.5	2	8.3
No Children With decreased Dental anxiety Score	3	30.0	28	59.6	18	75.0
No. Children With no Change in Dental anxiety	1	10.0	7	14.9	4	16.7

Although the mean dental score of the children managed without any form of psychological technique increased, that of 3 of the 10 children actually decreased, while that of 1 did not change. Likewise, 12 of the 47 children managed using a single psychological technique increased, while that of 7 did not change. Also, 2 children managed using combined technique increased, while that of 4 children did not change (Table III). A look at the table also shows that more children had the anxiety level decreased with the use of combined psychological techniques than otherwise and vice versa.

Further analysis showed that there was no statistically significant difference between the mean of the pre-treatment dental anxiety score in children managed with no psychological techniques and those managed with either a single ($p = 0.59$) or combined ($p = 0.18$) techniques. However, there was a statistically significant difference in the pre-treatment mean dental anxiety score of children managed with a single psychological technique and those with combined techniques ($p = 0.0097$).

Also, there were statistically significant differences between the post treatment mean dental anxiety scores of children managed with no psychological technique and those managed with a single technique ($p < 0.001$) as well as those managed with combined techniques ($p = 0.002$).

DISCUSSION

The highly statistically significant reduction of the anxiety level of the child post management when compared to the anxiety level before treatment shows the high success that can be achieved through the use of psychological management technique as an adjunct to definitive therapy.

Behavior management generally refers to the means by which, the dental health team efficiently and effectively performs treatment for a child and at the same time, instills positive dental behavior.[27] These patients were exposed to non-invasive behavioral management strategies, thus, avoiding the possible side effects from pharmacological drugs, and that of analgesia and anesthesia, while ensuring that the anxiety is adequately dealt with and possibly eliminated. Nathan[2] noted in his study that the use of pharmacological agents do not eliminate anxiety, but merely enhance patient acceptance of treatment by reducing arousal and modifying anticipation of danger.

Thom *et al*.[26] study further corroborated this by demonstrating that dental phobic patients treated with pharmacological agents relapsed after dental treatment, whereas those managed by psychological techniques improved and continued to do so during the follow up management. So also did Aartman *et al*.[29] study, which demonstrated that a large proportion of patients with high level of dental anxiety could be treated with psychological technique alone successfully. The use of sedation is thus, only advised when behavioral management strategies have failed.

All the children in this study were treated successfully through the use of various forms of psychological techniques. This is because these children were able to comprehend, accept and comply with instructions and could respond on their own to actions, both expressed and unexpressed, of the dentist. Although these psychological techniques entail spending more time in the operatory before and during treatment, the result is rewarding to both the dentist and the child not only immediately, but also on the long term. This is because treatment can be done out with minimal disturbance to the dentist and the child becomes more relaxed. Also, in the long run, you would have made a dental operatory friendly child, who can willingly come into the clinic at all times with minimal anxiety. This is corroborated by Thom *et al*.[28] study wherein 70% of all the patients managed using psychological techniques continued dental treatment for a long while compared to 20% managed using pharmacological agents.

The effectiveness of using psychological techniques to decrease the dental anxiety level of children was demonstrated by the significant difference in the post-treatment mean dental anxiety score of children in whom no psychological technique was used when compared with those in whom either a single or combined techniques are used. There was a statistically significant decrease in dental anxiety score when single or combined techniques were used when managing the child in comparison to when no technique was employed. The effectiveness of these techniques become more apparent when there was no statistically significant differences established in the pre-treatment mean dental anxiety score of the three groups.

Also, a statistically significant difference was established between the pre-treatment mean dental anxiety score of children managed using a single technique and those in which combined psychological technique was use. Those in whom two or more techniques were used had a significantly higher dental anxiety score. Previous studies had reported that dentists tended to communicate more with children with high anxiety levels.[17,30]

Communication may entail the questioning of children for feeling and understanding, as this tends to make them more willing to trust the clinician.[17] This means employing more forms of psychological techniques that entails communication. It is important to note that communication can also be used negatively as the use of fear promoting words, coercion and coaxing (threat of scolding), persuasion, rules and rhetorical questions does nothing to alleviate anxiety in children. Rather, these signals show that the dentist is being frustrated by the child and the child in turn, senses this.[2]

The effectiveness of using combined psychological techniques when compared with that of single technique is reflected in Table III. There were a higher percentage of patients, who had dental anxiety level decreased compared to when a single or no psychological

technique was employed and vice versa. The effectiveness of using two or more techniques over the use of single technique may be due to the fact that more techniques take care of more aspects of anxiety than a single technique would do.

The "Tell-Show-Do" was found to be the most common single psychological technique used. This technique helps the child to understand that the treatment procedure is harmless and something the child can cope. However, the focus of the child would still be on the treatment procedure when treatment is initiated and thus the child may be a bit tense, while employing coping strategies at the initiation of treatment. However, with time, as the treatment goes on, the child may relax. On the other hand, when techniques are combined simultaneously, those that help he child to cope are used along with other techniques that distract the child.

Distraction reduces the focus of the child on the treatment procedure thereby helping the child to relax in addition to coping with the treatment procedure at the initiation of treatment.

In this study, restraint was used. The use of restraint in the management of the child dental patient has generated a lot of controversy in recent times. It is considered as assertive and aggressive by some. However, conscientious on the possible use of the technique in patients, who exhibit temper tantrum exist when informed consent is received from the parent or the guardian of the child. Judicious use of this technique can produce good results as this study shows. In both children (9 and 10 year old respectively), the technique was combined with others. The dental anxiety scores decreased from 17 to 11 in first child and from 27 to 17 in the second child.

CONCLUSION

Since children with dental anxiety are both time consuming and costly to treat on the long run, prevention of dental anxiety is of utmost importance. Prevention of dental anxiety development through the use of effective psychological techniques, should be a fundamental part of dental training. Since these techniques are safe, free from adverse effects, helps give the patient a sense of control, and have been shown to help to significantly reduce dental anxiety, their use should be encouraged.

Although this study demonstrates that psychological techniques, used singly or in combination, can effectively reduce dental anxiety in children, there is a need to also study what other factors affect dental anxiety in this group of children and what other variables affect the use of psychological techniques for the management of anxiety in children should be encouraged. There is thus, a need to improve the education and training of dental students and postgraduate residents to take cognizance of these educational needs.

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