Play therapy in Pediatric dentistry- A scoping review.

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ABSTRACT

Purpose–
The objective of this scoping review was to map the evidence on the applications of play therapy in pediatric dentistry. Theevidencescreened by the pre-determined inclusion and exclusion criteria to be tabulated and data extracted to be summarized to detect the potential of play therapy and any gaps in the literature. Recommendations were to be made according to the limitations and scope of application.
Materials and method-

An electronic search from four databases (PubMed, Embase, Cochrane, and Google scholar) for relevant studies over the past 10 years.

Results-

15 articles, available asfull text in English language were finalized after screening. As per the extracted data, the following applications ofplay therapy were 1. Puppets and dolls for Dental education. 2. Playful breathing for Relaxation and Distraction

3. Playing for anxiety control .4. Play for behaviour analysis. Accordingly, limitations were detected and recommendations wereprovided.

Conclusion-

The responsibility of the pediatric dentist is not only to alleviatethe dental problems of the child but also to instil a positive outlook toward dentistry. This technique of Play therapyshows potential,however, there is scope for more research. The varied applications should be modified and adapted to pediatric dentistry to create a friendly dental experience for the pediatric patient.

Keywords- play therapy,behaviour management, relaxation, bubbles, puppets, dolls.

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Introduction

Landreth (2002)[1] stated "Play is a child's language and toys are the words." Play not only is fun but also satiates curiosity, involvesthe use ofinnovative skills and is stress relieving. It encourages social interactions, rapport buildingand communication where children can try outnew skills freely in a way they comprehend without the structured confines of "the real world" or the needto use verbal language or the fear of being judged.[2].Since the beginning of the 20th century 'Play therapy' is a popular psychotherapeutic intervention, where psychiatrists, psychologists, social workers, counsellors, child life specialists, nurses, occupational therapists, family therapists and specialists Play therapists harness the curative powers of play to overcome psychosocial challenges from social awkwardness, school adjustments, dealing withtraumatic events likesexual abuse, natural calamities, overcoming grief due to loss of loved one,parents divorce, etc. to managing angerand behaviours of specialchildren .[2]

The Association of Play therapy established in 1982, located in Clovis, California defined it as "The systematic use of a theoretical model to establish an interpersonal process wherein trained play therapists use the therapeutic powers of play to help clients prevent or resolve psychosocial difficulties and achieve optimal growth and development."[3]

Schaefer (1999) was the first to review and summarize the therapeutic powers of play. He classified it into eight broad categories: communication, emotional regulation, relationship enhancement, moral judgment, stress management, ego-boosting, preparation for lifeand self-actualization. [4]

Pediatric dentistry not only involves the successful treatment of children's dental problems, but also instilling a positive dental attitude in the child. In today's time and era, the dentist-child patient relationshiphas moved from an authoritative to a supporting position andgiving children a right to be involved in their treatment options has becomea must[5].

There is enough evidence on conventional non-pharmacological and pharmacological techniques of behaviour management. However, the main concerns with these pharmacological techniques are the expenditure, safety, legal concerns, etc.Whereas the otherwise inexpensive non-pharmacological techniques may not always be successful as the child might find it difficult to comprehend abstract ideasand might consider the dentist as an authoritarian figure or the dental clinicas a place of punishmentlet alone parental acceptance of aversive techniques.[6]Thus, there seems to bea paucityofa newer, child-friendlierbehaviour management technique in relation to not only behaviour management but also attaining the pediatric patient's compliance in terms oforal

hygiene instructions, diet instructions, habit cessation, post-operative care andcounselling, etc.This scoping review attempts to explore evidence on the applications ofplay therapytechniques utilised in pediatric dentistry.

Materials and methods

Design-This scoping review wasa systematic approach to map evidence on play therapy in pediatric dentistry to identify its applications, outcomes and knowledge gaps. It wascarried out bythe frameworkprovided by PRISMA Extension for Scoping Reviews (PRISMAScR): Checklistand Explanation. [7]

Search strategy-A comprehensive electronicsearch was conducted by twoindependent authorsby the predetermined inclusion and exclusion criteria. The primary search terms werepediatric dentistry AND play therapy AND play. Several search/MeSH terms with play therapy and pediatric dentistry, alongwith the tangible elements ofplay therapy like dolls, puppets, clay, bubbles, pretend play and role play were appropriately combined. The references were screenedand duplicates were eliminated. The differences were resolved by consensus with the aid of a third examiner.

Inclusioncriteria -

1. The population was pediatric dental patients ranging between 3 to 14 years of age.
2. Publishedin the last 10 years ie 2012 to 2022.
3. Randomised controlled trials, quasi-experimental, observational studies(cohort, case-control, cross-sectional, case reports).
4. In national and international journals.
5. In English language.
6. Full text available.
7. Interventionsthat mentionedplay therapy or the tangibleelements of play therapy.

Exclusion criteria-

1. Surgical interventions like cleft lip and palate surgery.
2. Children with special health care needs.
3. Thenewer advents like video games, artificial intelligence, game designs and non-tangible elements likemusic, storytelling and art activity.
4. Grey literature, comments, editorials, short communications, letters.

Data extraction-The data from the finalised studieswas entered into a predesigned tabular formatwith the following details- 1. Author and year; 2. Study design.;3.Country; 4.Play therapy aid. 5.Variables measured and 5. Main findings.

Results-

The literature search conducted depicted that they were few studies exploring play therapy in dentistry. Total studies with potential were 57. After screening, the duplicates were removed (n=9). The studies based on storytelling (n=18), art analysis (n=15) and those based on games(n=4) despite being in exclusion criteria were screened todetect whether the includedelements of play therapywere used in combination. Out of these 4 were included. After reading the full-texttotal availablein English, 15 relevant studies were finalised.The number of randomised controlled trials was 8, non-randomised trialswere1, quasi-experimental studies were4, cross-sectional studywas 1, and clinical studies were1. The majority of the studies were conducted in India.The elements of play therapy like puppetsand bubble breath were studied the most. The data obtained was condensed in Table no.1.

Table no.1

Sr. no.	Author and Year	Study design	Country	Play therapy Aid	Variables measured	Main findings
1.	Manan NM et al[8].	Non-Randomized clinical	Malaysia	Clay moulding	Anxiety level was assessed by	In all interventions , there was lower P-value in Visit 2 for

	(2015)	study			using Malay-Modified Child Dental Anxiety Scale.	simple dental procedures with the hand instruments but not related to dental hand pieces. The clay group showed better acceptance to dental procedures.
2.	Helena de Siqueira C et al. [9]. (2017)	Quasi-experimental.	Brazil	Plush doll with teeth set.	Brushing behaviour based on10 pre-determined points	A significant increase in the adoption of appropriate behaviours for tooth brushing ($p < 0.01$). The most appropriate change was seen in amount and the highest error was seen in brushing the lower arch teeth and cleaning the tongue .
3.	Vishwakarma A.P. elal[10]. (2017)	Randomized controlled trial	India	Role play	Anxiety by heart rate, faces image scale, Venham picture scale.	The variables were significantly lower among children who received 'play' intervention. ($p<0.05$)
4.	Kiran S et al [11]. (2018)	Clinical study	India	Bubble breath	Anxiety assessed by graphology method	Significant reductions in stress levels were observed in the drawings which were made after play therapy. ($p<0.001$).
5.	Raja Rajeswari S. et al [12]. (2019)	Randomised clinical study design	India	Free play with Building blocks, drawing.	Anxiety level by pulse oximeter and Facial image scale.	Upon comparison , the reduction in subjective and objective anxiety scores was higher in 'play' group ($p = 0.0$)
6.	Sowmya S et al[13] (2019)	Randomized clinical study	India	Bubbles	Behaviour by Frankl's behaviour rating scale, anxiety by Facial Image Scale and pulse rate, and	Upon comparison, pain perception, significantly reduced in play group ,($P < 0.001$) but there was no statistically significant difference in dental anxiety .

					pain perception by Wong-Baker FACES and Faces, Leg, Activity, Cry, and consolability scale.	
7.	Suresh A. et al[14]. (2020)	Cross-sectional study	India	Miniatures pretend toys like patient, dentist, dental clinic.	Behaviour in dental clinic analysed by Frankl's behaviour rating scale.	The observed association between the doll placement pattern and the behaviour of the patient during dental treatment was statistically significant (P< 0.001).
8.	Obadiah I, Subramanian EMG. [15]. (2020)	Randomized Controlled Trial	India	Soap bubbles.	Behaviour by Frankl's behaviour rating scale and Facial Index scale. Pain perception by Wong Baker Faces pain scale . Anxiety by Face Leg Activity Cry Consolability scale .	In the intervention group, the behaviour observed improved in the second visit (P-value=0.042). Pain perceived and anxiety showed no statistically significant difference . (P-value= 0.061).
9.	Ediyarsari P et al[16] (2020)	Quasi - experimental	Indonesia	Puppets.	Oral hygiene by Oral hygiene index and oral health knowledge by questionaire.	Upon comparison, the average value of puppet stories(62.50) is higher .
10.	UmmeAzheret al [17]. (2020)	Randomized clinical study	India	Bubbles	Anxiety by Venham picture scale and heart rate	After dental treatment, the percentage of children was only 4.2% in play group as compared to

					by pulse oximeter	33.33%.They appeared relaxed after the intervention .However, it could be considered as an option.
11.	Omidpanah Net al [18] (2020)	Triple-blind crossover clinical trial	Iran	Bubbles	Pain perception by Visual analogue scale.	Upon comparison, there was no statisticalsignificance (P value >0.03).
12.	Souza L et al [19]. (2020)	Quasi experimental study.	Brazil	Play activities.	Corelation of emotions to treatment by selection of Placards depicting emotions.	The negative emotions were primarily observed before the playful activities and decreased after the dental treatment. Most patients showed collaborative behaviour.
13.	Bargale S.et al [20]. (2021)	Randomized clinical study	India	Pinwheel	Anxiety by animated emoji scale	Upon comparison , pinwheel breathing exercise showed higher values with t value of 1.42 but was not statistically significant with a P value of 0.161.
14.	Ladera-Castañeda M .et al [21] (Jan 2022)	Quasi-experimental Study	Peru	Puppet theatre show followed by personal interaction with puppet.	Oral hygiene by Greene Vermillion index and oral health knowledge by questionaire.	The variables measured improved significantly (P < 0.001) over time in all pre-schoolers, except in those who came from the rural area (P > 0.05).
15.	Bahrololoomi Z[22]. (2022)	Cross over Randomized Clinical Trial	India	Bubble blower	Anxiety measured in terms of blood pressure, pulse rate and pain by Wong Baker faces Pain scale(WBFPS) and Faces leg	Upon comparison, the differences in pain perception were statistically significant (P value <0.05). However, anxiety levels were lower in 'play' group but not statistically significant.

					activity cry consolability (FLACC)	

Discussion

After reviewing the data, the following applications of play therapy in pediatric dentistry were studied-

1.Puppets and dolls for Dental education-Ladera-Castañeda et al [21] conducted a study where pre-schoolers were given didactic dental education concerning diseases of the oral cavity, dental hygiene and the importance of visiting the dentist, cariogenic food through the medium of hand operated puppets. The authors state that the direct interaction with the puppetgenerated reflective thinking by identifyingwith the characters to create positive awareness in a fun manner. The repeated sessions over a period of four weeks further reinforced the lessons. Helena de Siqueira C et al. [9]. conducted a study with nurses in preschool, where a combination of play activities including the demonstration of brushing on a toy with teeth sets was utilised.The authors call it a reframing learning technique. Ediyarsari P et al[16] claim that dental education through puppets wasmore effective thanmovie media. The authors agree with Razi (2018) who stated that during 2 to 7 years which is the pre-operational stage according to Piaget's cognitive development theory, children comprehend stimulitheyreceive through the five senses rather than abstract or logic-based reasoning. Thus, children tend to engage in pretend play as they begin to master symbolic functions.

2.Playful breathing for Relaxation and Distraction-The breathing relaxation exercises cause a series of events, theyenhance vagal activity, serotonin secretion, and an anti-pain neurotransmitter while decreasingthe levels of stress hormones. [23] . Thus, reduction of pain perception,anxiety and can help in distraction. Bubble breath seems to bea relatively popular play therapy exercise in pediatric dentistry. In three of the studies [15,18,22]the children were asked to practise with the bubble soap solution at home before their appointment. In the mentioned studies [15,17,18,22]there was a reduction in the parameters butno statistical difference. However, Sowmya S et al[13]in their study showed a statistically significant outcome in the bubble relaxation exercise in terms of pulserate values than the control group.Kiran S et al [11]analysed the children's free drawings by graphology methodfor children undergoing restorations. They found a highly significant difference in reducing the anxiety of the bubble breath group. In contradiction, UmmeAzheret al[17]report that the pulse rate slightly increased in the bubble group after restoration with airmotor as compared to the conventional Tell Show Do group indicating heightened anxiety level, however it was still lower than baseline. They received no prior guidance on the technique. We recommend that the children must practise the exercise to learn to take deep breaths. However, at the dental appointment, the child's inherent personality and coping skills come into play. For example, nerve blocks are more painful than restorations butwith restorations, the prolonged vibrations and sound of the drill could scare some children more. Thus, every child could react differently. However, with bubble breath, the child is familiar with deep breaths thus preventingshort breaths and in turn decreasinganxiety.

There was onlyone mention of relaxation bybreathing over a handheld pinwheel showing similar results to bubble breath studies[20]. The colourful pinwheel serves as a distraction aid to lower pain perceptions as well.

3.Playing for anxiety control-Raja Rajeswari S. et al [12]combinedthe concept of Cognitive behavioural therapy (CBT) which is an active form of distraction, wherein children were encouraged to be involved in activities that calm like playing with building blocks, draw

pictures and free play without any direction. They report it to be more effective in reducing preoperative anxiety when compared withaids of passive distraction like audiovisual, where the children remain quietand observe and also with conventional Tell Show Do interventions.

Instead of random play in the playroom, Vishwakarma A.P. et al[10] endorses the use of a life-size customised therapeutic toy with open mouths and teeth. Various pretend toys resembling dental equipment are provided for the child to play with and learnunder the direction of the dentist. This role-playing therapeutic play would help the child understand the dentist's frame of mind.

Another inexpensive play therapy aid is clay. The new smell and the pleasant smooth feeling gives the excitement of moulding three dimension figures.[10]The study by Manan NM et al[8] is the only study thatmentions clay moulding in pediatric dentistry. Clay was seen to be a toy of choice and the child built stories around its moulded clay figures. This playful activity not only provides sensory pleasure thus reducing anxiety but also actsas an outlet of expression without judgements.

4.Play for behaviour analysis-It has always been challenging for a pediatric dentist to understand the thoughts and opinions of the childthat could help in better handling the child. Suresh A. et al [14] provided children with a simulated dental clinic with miniature dolls. Upon analysis, there was a direct correlationbetween the placement of the patient dolland the child's behaviour in the dental clinic. The thoughts of wanting the parent in the dental clinic were also externalised in this play. This simulated clinic would also provide an introduction to the actual clinic in a safer more child-friendly manner. Souza L [19]evaluated the emotions of the child after engaging in play workshops during dental visits toshow positive emotions associated with play.

Thus,free play activitiesnot only create a welcoming atmosphere but play bringsto the surface what often cannot be comprehended in words. This helps the child externalisefears and express them by re-enactingthe problematic situations and finally resolving them.[25]

Limitations and recommendations

The first mention of play as therapy was by Sigmund Freud in 1909[26]and even when it became a popular therapy in child psychology, there is very little literature evidence on play therapy in dentistry. Out of which even fewer mention the term or discuss its therapeutic powers.

We recommend the use of therapeutic dollstoexplainnot just oral hygiene but also dental procedures like restorations and local anaesthesia with toy dental equipment. Thereis an added benefit of closeness between educators and children. This rapport-building is of great importance in pediatric dentistry to further compliance with treatment plans.

Play therapy not only deals with children but with approaches like filial play therapy [4]whereparents are trainedto use these playful activities to strengthen their connection with their children, resolve discipline issues, and also help the children work through traumatic experiences such as hospitalisation. This can be adapted by involving the parents while managing disruptive behaviour in the dental clinic or even in aspects of diet counselling or post-treatment care.

The outcome of play therapy depends on the length and frequency of the session with adequate approximations, thus in the dental clinic,we recommend the design of the playroom with therapeutic toys with which the child can engage in free play. Also, the dental auxiliaries could be trained to hold these sessions.

Play therapy not only helps to resolve the problems of the child, but it also helps detect the inner fears and thoughts that the child is unable to expressin words. Thus, we recommend its adaptation to behaviour and anxiety rating scales.

Various studies[27], depict puppet shows for dental education, however, a change in format with one on one interaction with the

puppets with the incorporation of role-playing could harness the therapeutic powers of play into a passive media technique.We recommend the incorporation of the theme of playinto dental camps at schools or the community level so thatchildren from every stratum of society could be introduced to dentistryasfun and non-threatening.

Conclusion–Our scoping review which mappeddata over the past 10 yearsdepictsa lack of adequate evidence.We see a multi-fold advantage of play therapy thatcan be adapted intopediatric dentistry. Its broad spectrum of applications from counselling, behaviour analysis, and dental education to managing disruptive behaviours in the clinic appears to be promising. This inexpensive technique of play therapy could add a new dimension to the non-pharmacological behaviour management of children in the dental clinic. On the other hand, children needto be communicated in their most fundamental language. Thus, Play therapy does seem tofulfil our responsibility as pediatricdentists of instiling a positive attitude towards dentistry from an early age.

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