



Fundamentals in Paediatric Dental Clinic Set – up: A Comprehensive Review

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Authors' contributions

This work was carried out in collaboration among all authors. Author MS designed the study, wrote the protocol, managed the literature searches, collected information and wrote the first draft of the manuscript. Authors ST and DC guided to design and compile the data. All authors read and approved the final manuscript.

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ABSTRACT

The behavior management of the child patient includes many techniques and policies. It requires skills in communication, empathy, coaching, and listening. Designing a paediatric dental clinic that accommodates these management strategies and techniques is a part of the “art” of behavior management. The dental environment as such has an important role in physical, physiological, and psychological health and nowadays it is becoming a topic of concern. Designing a dental clinic in yesteryear, evolved into an art form into which subjectivity, creativity, and aesthetics were introduced. In therapeutic and mechanical amenities, in designing a child - friendly dental environment that promotes a positive psychological attitude is discussed.

Keywords: Clinic set –up; paediatric; dentistry; dental clinic.

1. INTRODUCTION

While designing a paediatric dental clinic not only therapeutic and mechanical facilities should be

modified accordingly, but also the architectural reflections as it have an impact on child psychology [1]. Evidence-based design is a theoretical concept in the creation of healing

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environments which has been used successfully in recent years while constructing hospitals especially for children [2]. Fear from dental environment enhances dental anxiety, with a prevalence of 4 to 43% in children of different population [3] and it is a common problem in children and adolescents worldwide [4]. Therefore every effort should be to design a child-friendly environment.

Internal and external environment, even, the attitude of staff members [5] have a role in providing patients a sense of relaxation and comfort. It could be achieved by proper application of sciences of light and shadows, rules of colors and laws of architecture finally resulting in a very special and relaxing adaptive space design [1,6]. As access and utilization of oral health services by children is dependent on various factors related to the children, parents, and health facilities [7], getting everything under a single roof is a quite strenuous job.

Even more dental technicalities are also evolving, such as electronic dental records, advances in digital imaging, teledentistry and many more [8]. So one should be aware of the trends of a century while dealing with the technical and architectural side of dental clinic working space.

Often children and adolescents are neglected in fields such as architectural and urban planning, although they are typically more sensitive to environmental aspects compared with adults. A child's interaction with the clinic environment and the health care providers can influence even their future health behaviours, as children do not like to visit a place where they have experienced discomfort previously.

2. HEALING ENVIRONMENT

A healing environment can be defined as a holistic environment that distracts the patient from the anxiety and facilitates effective patient rehabilitation [9].

2.1 Concept of the Healing Environment

According to literature it also facilitates an easy patient recovery [10]. This in turn indirectly improves doctor-patient relationships in the future, augmenting the quality of healthcare provided.

A physical environment can be;

- Indoor environment –Various literature suggests safety, lighting, sound, color, creative artworks, furnishing, and the general atmosphere as the essential factors to be considered.
- Outdoor environments – According to Altimier an outdoor view, natural sunlight, neutral colors, therapeutic sounds in the clinic, and also the collaboration with family are curative [10].

National Taiwan University Hospital in Taiwan, (estd.1895) and Sapienza University of rome [11] are good examples of healing environment for children.

2.2 Incorporating Effects of the Healing Environment in Dental Clinic Set Up

2.2.1 Reception

When a child is introduced into a new environment, his or her mind will try to perceive it distinctively. And it is unique for each child. As the child enters the first space, the reception, it should meet and greet his needs and expectations. Behavior management starts right here. In the initial dental visit, the child is unsure about what is going to happen. To alleviate his anxiety he should be provided with a warm welcome, jovial conversation, and a bouncy atmosphere.

2.2.2 Waiting and play area

While designing a waiting area for children, one should keep in mind that, they usually do not sit in one place and cannot be idle for long time. So enough empty spaces to move around should be provided so that even waiting for a long time is tolerable, at any chance.

According to Mitcherlikh, games can fosters talents, abilities, capabilities of children and strengthens their mind, body and soul [12]. According to Pakzad & Bozorg, play is the child's effort to cope with the environment, through which he finds himself and understands the world [2]. Spending the waiting time playing smarter and cooler games will itself rise a happy mood before entering the operatory room. Literature reports that such children are more likely to be co-operative for the treatment as games can relieve the dental anxiety [1]. If the clinic has a

great deal of space it can create an environment where children can get involved in multiple activities with a peer group.

2.2.3 Management room/health education room

Every pediatric dental clinic should have a management room/health education room [13], where proper instructions regarding preventive procedures are provided to the child and the parent. On entering the room, the child should not feel a quantum leap and should maintain the state of comfort. So, this area should be away from all kinds of stress. Slide, filmstrips, records, films, pamphlets, charts, and models are useful for instilling a positive dental attitude.

2.2.4 Examination room and treatment room

In most clinics, the examination room has been integrated into the treatment room due to lack of space. But for a pediatric dental clinic, the separation of such a room is essential, because the direct entry of child to the treatment elevates their anxiety. This is the first place a child gets familiar with the dentist and the dental operator environment. Every effort should be taken to familiarize the child to the setup, following his cognitive level. Arranging oral hygiene kits including baby doll toothbrush and children's toothpaste besides dental chair is suggested. Even on the dental chair, installing devices such as kid's dental turbines, kid's handpieces with a rubber tip on them, and small monitor helps child to get acclimatized.

Special attention should be given to the decoration and design of the treatment room. There must be special creativity that upon the arrival the child should have a feeling that he has entered into a friendly and childish environment or imaginary space just as an extension of examination room. This explains the need for implementing child centric themes and decors.

Also, the work area preferably should face the reception area, so that even while performing clinical duties, staff can have look at the reception area for any patient needs and can greet patients immediately on their arrival [14].

2.2.5 Radiography in children

For an infant below 3 years of age, it is always recommended to use size 0 intraoral periapical films for the exposures. Extraoral radiographs

like panoramic, lateral jaw, or 45° projections are preferred for handicapped children, young patients, or patients with a gag reflex. Management techniques such as desensitization, Tell, show and do the technique, Lollipop radiograph, Reverse bitewing [15] can be used accordingly.

2.2.6 Additional considerations

Nitrous oxide/oxygen inhalation sedation is the most commonly used behavior management technique in Pediatric dentistry. To ensure systematic & thorough preparation for every sedation, the AAP recommends following S O A P M E. (Suction, Oxygen, Airway, Pharmacy, Monitor, Equipment) [13]. The use of a rubber dam improves the effect of the sedation and reduces atmospheric pollution [16]. Plumbing requirements should be adequate for ventilation and also the suction system so that it will not reenter the building.

Hartig et al. and Franz et al. [17,18] considered that the positive effects of green spaces on mental health are countless both during treatment and healing post treatment. Recent advances like laser technology, have set the stage for revolution in pediatric dental practice to provide optimal, preventive, interceptive, and restorative dental care in a stress free environment [19]. Design consideration should consider newer non-invasive techniques as well.

3. DENTAL CHAIR MODIFICATION IN PEDIATRIC CLINIC

Pediatric dental chair and patient positioning aids deliver more safety because of their compact size appropriate for a child. Small, thin, and adjustable headrests allow enhanced accessibility to the child [20].

A movable or adjustable spittoon should be available so that patients don't have to stand or lean forward to reach. Proper positioning of the child patient, not only increase productivity but also have positive upshots for the operator's posture, comfort, and career longevity [21].

4. EFFECT OF SOUND, SMELL, TASTE AND COLOUR IN DENTAL CLINIC

Sound proofing in the pediatric dental office is important, where periodic crying, unexpected yells, or screams are inevitable. The voice of the

air-rotor hand piece, ultrasonic cleaner also cause objectionable anxiety in the child. Light instrumental music can be used to mask these sounds.

Different scents can evoke different feelings. For example, the citrus smell is often associated with cleanliness. However, it is difficult to find one scent to please everyone [6].

Children are very sensitive to taste. The sense of taste can be evoked by anything that is put in patient's mouths ranging from the food and drink provided in the reception area to the polishing paste and fluoride used in treatment. Care must be taken while spraying LA or while doing any restorations, as they can evoke a negative behavior at any point in time.

Goethe (1840) created a color wheel showing the psychological effect of each color. The use of warm colors like yellow and cool colors like blue in the operatory could create a positive dental attitude. Black and red colors are not suitable [12].

5. CONSIDERATIONS IN DENTAL CLINIC DESIGN FOR SPECIAL CHILDREN

In a flawless design, an efficient environment is a multiple interactive area between the constituent elements of a space, where people of all kinds can mingle without much hindrance [22]. As dental office is a place of public accommodation. Failure to accommodate patients with SHCN could be considered discrimination and a violation of fundamental rights [23]. Therefore a pediatric dental clinic should be disable friendly.

Movable equipment should enhance the opportunity for the patient's wheelchair to be backed into the operatory. Dental chairs should be adjustable for height to match different wheelchair designs. The Diaco dental chair is an innovative product, which allows patients to stay in their wheelchair during their dental appointment [24]. Modalities for alternative behaviour management such as protective stabilization (bean bag dental chair, Head stabilizer, forearm body support), conscious sedation, general anaesthesia should be considered.

6. DENTAL ANXIETY MANAGEMENT AIDS IN PEDIATRIC CLINIC

An understanding of child psychology especially, the Classical conditioning theory, which,

operates by the simple process of association of one stimulus with another [25]. Dental clinic atmosphere is presented with a wider range of stimuli, including feelings, sounds, smells, and tastes, all evoking distress [26]. Because of this association, behavior management is easier if the dental office looks as different from a regular hospital clinic as possible. It is helpful in reducing children's anxiety if the attire of the dentist and staff are different from those associated with the typical physician. Moreover, a treatment that might produce pain should be avoided if at all possible on the first visit to the dental office [27].

The dental clinic should have a full spectrum of techniques available to manage a child with anxiety such as tell-show-do, relaxation, distraction, systematic desensitization, modeling, audio analgesia, hypnosis, and behavior rehearsal [28]. According to some studies white noise appears to directly suppress the pain caused by dental operation and also removes a source of anxiety by masking the sound of the drilling machine [29]. Studies reported maximum clinical anxiety/fear reduction was found in audio-visual group followed by the audio group. Therefore both audio-visual and audio distraction aids may be considered while designing a clinic as good alternative in managing anxious child [30].

The Snoezelen environment can also be considered while designing a dental clinic. It consists of a multisensory adapted environment united with client-centred therapy, which helps patient to get rid of anxiety, pain, and unrest, including individuals with developmental disability. Research documenting the outcome of the Snoezelen environment reports reduction of pain, behaviour facilitation, and even balance in heart rate [31].

According to some studies maladaptive behaviors and noise levels in a classroom for special needs children, reduced when adapting overhead lighting. This can be tried in dental atmosphere as on distraction, the processing of pain signals is correspondingly reduced [32].

7. PATIENT SAFETY

Patient safety is the most essential component of quality oral health care for infants, children, adolescents and children with special health care needs. Therefore the American Academy of Pediatric Dentistry (AAPD) recommends that the design features should be planned and

evaluated periodically for patient safety. Especially, play structures, games, and toys should be assessed, which are some possible sources for accidents and infection [33].

8. CONCLUSION

In designing a child-friendly dental clinic, but also instills a positive dental attitude in child, thus creating a great atmosphere for child, parent and clinician.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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