

Effects of audio-visual aids on convincing patients for dental treatment – A review

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ABSTRACT

The aim of the study was to evaluate the different types of audio-visual aids available and their effects on convincing patients for dental treatment. There are various factors that may influence the behavior of a reluctant patient toward dental treatment. It is very important for a dentist to understand the theories behind such behavior and develop ways to overcome this condition. Unlike the existing educational materials, audio-visual aids provide a comprehensive, self-directed, and evidence-based approach to the promotion of oral health. This study provides information on the various form of audio-visual aids such as DVD-video containing evidence-based information about oral health care and prevention-based on the provided guidelines as means of helping patients to understand the whole concept of dental treatment and its importance on the overall health of an individual. The audio-visual aid is an effective tool in providing anticipatory guidance for the convincing patient for dental procedures. Audio and audio-visual distraction techniques provided an effective reduction in dental anxiety.

KEY WORDS: Aids, Audiovisual, Patient, Reluctant, Video

INTRODUCTION

Fear can be defined as an individual's response to an actual threatening event or a dangerous situation to protect one's life. This could lead to a fight-or-flight situation.^[1] Anxiety is an emotional state that precedes the actual encounter with the threatening stimuli, which sometimes are not even identifiable.^[2] Dental fear or dental anxiety is usually provoked by stimuli such as the sight of injection or drilling.^[3] Dental anxiety refers to patient's specific reaction toward stress associated with dental treatment in which the stimulus is unknown, vague or not present at the moment.

Phobia is an unrealistic, intense and persistent fear of a specific stimulus, resulting in complete avoidance of the perceived danger. The term "odontophobia" can be described as an overwhelming and irrational fear of dentistry associated with devastating feelings of hypertension, terror, trepidation, and unease. This term has been diagnosed under specific phobias

according to the diagnostic and statistical manual of mental disorders-IV and the International Statistical Classification of Diseases and Related Health Problems-10.^[4]

Fearful and anxious individuals often will feel that something horrible is going to happen during dental procedures, and hence avoid visiting the dentist. This behavior ultimately will lead to bad oral hygiene and oral health, with increased number of missing teeth, decayed teeth, and poor periodontal status.^[5] They will report to the dental clinic only when there are an acute emergency situations often needing complicated and traumatic treatment procedures, which will only make their fear worse, leading to complete avoidance in the future. Hence, a vicious cycle of dental fear sets in if these patients are not managed appropriately.^[6] Before beginning treatment, dentists should be able to detect patient's level of anxiety and fear so they can manage the patient's anxiety to provide a more comfortable environment for the patient to receive dental procedures.

Dental anxiety can usually be managed by psychotherapeutic interventions, pharmacological interventions, non-pharmacological interventions,

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or both. Psychotherapeutic interventions are either behaviorally or cognitively oriented. Pharmacologically, these patients can be managed using either sedation or general anesthesia.^[7] Examples of psychotherapeutic intervention are as follows:

1. Communication skills, rapport, and trust building:
 - Latrosedative technique
2. Behavior-management techniques
3. Relaxation techniques: Deep breathing, muscle relaxation
 - Jacobsen's progressive muscular relaxation
 - Brief relaxation or functional relaxation therapy
 - Autogenic relaxation
 - Ost's applied relaxation technique
 - Deep relaxation or diaphragmatic breathing
 - Relaxation response
4. Guided imagery
5. Biofeedback
6. Hypnotherapy
7. Distraction
8. Enhancing control
 - "Tell-show-do" signaling
9. Positive reinforcement

Distraction is a non-pharmacological intervention technique, which can divert a patient's attention away from noxious or unpleasant stimuli, and is applied in clinical practice to reduce pain, anxiety, and fear associated with painful medical procedures.^[8] Giving the patient a short break during a stressful procedure can be an effective use of distraction before considering more advanced behavior-guidance techniques. Based on the theory given by McCaul and Mallot, a patient's perception of pain decreases when the patient is distracted from an unpleasant stimulus that evokes the pain.^[9]

Audio-visual aid is a new approach that has gained popularity to help relieve anxiety related to dental treatment that incorporates a visual as well as an audio component before doing dental procedures.^[10] The ideal distractor should possess multiple sensory modalities such as visual, auditory and kinesthetic, and active emotional involvement. These various abilities can hold the full attention of a child so as to minimize dental anxiety.^[11]

Examples of audio-visual aids are such as background music, television sets, computer games, and two-dimensional, and three-dimensional video glasses for watching movies. Human brain waves can be influenced by suitable music choices; this will lead to deep relaxation and cessation of pain and anxiety. Listening to pleasant music is a non-invasive technique where the patient can relax during a stressful procedure. This reduces the activity of the neuroendocrine and sympathetic nervous systems where there is a combination of relaxation and distraction.^[12]

AUDIO-VISUAL AIDS

Audio-visual aids can be defined as those sensory objects or images which initiate or stimulate and reinforce learning, based on John Burton in 1955. According to Kinder S. James, to make the learning experience more concrete, more realistic and more dynamic, audio-visual can be used. Based on Carter.V. Good, audio-visual aids are those aids which help in completing the triangular process of learning that is motivation, classification, and stimulation. Audio-visual aids can also be defined as supplementary devices by which the teacher, through the utilization of more than one sensory channel is able to clarify, establish and correlate concepts, interpretations, and appreciation according to McKean and Roberts.

The purposes of using audio-visual aids are as follows:

- To make teaching-learning more concrete.
- To serve an instructional role in itself.
- To create interest among the group.
- To make teaching as an effective process.
- To provide the best motivations and clear images.

There are various classifications of audio-visual aids according to the type of projection by various authors. Audio-visual aids can be classified into:

1. Audio aids
 - Audio materials are those which can be heard.
 - For example, radio, tape recorder, Walkman, headphones.
2. Visual aids
 - Help to visualize things.
 - It has two types:
 - Not requiring projection: Print material, exhibits, poster, etc.
 - Requiring projector: Slides, filmstrips, overhead projectors (OHP), etc.
3. Audio-visual aids
 - Can be heard and seen simultaneously.
 - For example, projected aids, TV, and films.

Audio-visual aids can also be classified into:

1. Projected aids
 - Films
 - Films strips
 - Opaque projector
 - OHP overhead projector.
2. Non-projected aids
 - Audio aids
 - Graphic aids
 - Display boards
 - Activity aids.

PRINCIPLES USED IN EACH AREA

Principles of Selection

Audio-visual aids should suit the age level, grade level, and other characteristics of the participants. It

should be eye-catching, interesting, and motivating. They should best represent the real things. The audio-visual aids should have in the realization of desired learning objectives.

Principles of Preparation

Materials used audio-visual aids should be available locally material. The teachers should undergo some training in the preparation of aids. The teachers themselves should involve in preparing some of the aids. Students can also participate in the preparation of aids.

Principles of Handling

The aids should be arranged such that it is kept safe and also to facilitate their lending to the teachers for use easily.

Principles of Presentation

Visualizing of the use of teaching aids is important for the teachers before their actual presentation. They should fully familiar themselves with the use and on how to conduct the aids efficiently. The aids should be inadequate care to handle in such a way as no damage is done it. All the students should be able to see the aids; hence, the aid should be displayed properly.

Principle of Response

Students should be able to respond to the activity of audio-visuals aids stimuli under the teacher's guidance.

Principle of Evaluation

It is necessary for continuous evaluation of the effectiveness of audio-visual aids.

VIDEO EYEGLASSES

In some dental settings, video eyeglasses are currently being used. Virtual reality immersion completely obstructs the dental environment and requires a computer with an advanced software program.^[13] However, there are a few scientific publications where they primarily document their use of video eyeglasses with adults undergoing scaling procedure rather than restorative dental treatment. Based on a study done by Bentsen *et al.*, it is found that video eyeglasses are used not to decrease the unpleasantness and pain of restorative dental treatment, but most patients reported that there is an overall beneficial effect and said they would choose to wear video eyeglasses for similar events.^[14]

All patients reported to be less anxious and discomfort in a study of dental prophylaxis with children using virtual reality immersion, with no significant differences between the study and control groups.^[15] Nonetheless, patients prefer the use of video

eyeglasses during treatments because it reduces their anxiety level. It shows that the use of audio-visual distraction eyeglasses inspires pleasant memories and positive attitudes toward the dental experience. Based on a study done by Ram *et al.*, video eyeglasses are a method of behavior management leading to improved cooperation and comfort during pediatric dental restorative procedures in selected cases when nitrous oxide sedation cannot be used in the particular procedures.^[13]

A recent study done by Rocha *et al.* stated that the importance of distress management interventions is to minimize negatively distorted memories. Anxious patients, in particular, may be showed more pain and develop a negative expectation toward dental procedures in the future.^[16] Based on a study done by Mitrakul *et al.*, audio-visual eyeglasses successfully reduced heart rates and physical distress during pre-operation and the first usage of the high speed hand piece. It could be used as an adjunctive distraction technique during dental treatment in children.^[17] Audio-visual distractions have been used widely and successfully to achieve an adaptive behavior during dental treatment. When compared to techniques such as music relaxation, storytelling, listening to the audios using headphones, playing video games, and watching television, the audio-visual glasses show that not only it can minimize dental anxiety but it can also enhances the cooperative behavior of the patient during the dental procedures.^[18]

Advantages

Audio-visual distraction eyeglasses give an alternative where there is of relaxation for children who respond negatively to oral sedation or nitrous oxide sedation, or who lack the possibility of communication with the clinician, for example, due to language barriers. The present findings found that audio-visual distraction eyeglasses can be used as an alternative to nitrous oxide sedation support previous studies. In a study of adults, the audio-visual distraction eyeglasses technique shows there is a shorter time taken for the dental cleaning procedure.

Disadvantages

A few children who show disruptive behavior and refused treatment will immediately reject the audio-visual distraction eyeglasses. Further, audio-visual distraction eyeglasses are not appropriate for children who are highly vigilant and insist on controlling the situation. While effective local anesthesia generally prevents the sensation of pain during dental treatment, the use of the audio-visual distraction eyeglasses is not sufficient enough to be used to eliminate persistent pain. The maintenance and the unavailability of eyeglasses for children with small faces limit the usage of audio-visual distraction eyeglasses. The average

duration of dental treatment was found to be longer than usual using audio-visual distraction glasses.

MUSIC

Non-pharmacological anxiety management interventions such as music listening are increasingly used in dental treatment nowadays. Findings regarding the use of music listening for dental anxiety are inconclusive even though efficacy for music's anxiolytic effects has been established for pre-operative anxiety, especially for children.^[19] The use of music for passive distraction may not be enough for highly anxious adults and children. Hence, interventions offered by a trained music therapist may be greatly needed to optimize music's anxiolytic impact on the patient. Music therapy interventions are individualized to the patient's presenting needs at enhancing patients' management of their anxiety. Interventions may include:

1. Active refocusing of attention
2. Music-guided deep breathing
3. Music-assisted relaxation
4. Music-guided imagery.

Furthermore, music therapists can teach patients music-based anxiety management skills before coming for their dental treatments, offer them the opportunity to express emotions related to the upcoming dental procedure, and help them to gain a sense of control and safety.^[20]

Based on a study done by Lai *et al.*, adults undergoing root canal treatment randomly assigned 44 participants to a music condition in which participants listened to sedative music (i.e. soothing piano music) or to a control condition in which participants wore headphones but did not hear the music. The results suggested a small treatment effect of the relaxing music condition for procedural anxiety (standardized mean difference [SMD] = 0.34).^[9] Kim *et al.* found that by listening to patient-selected music significantly decreased intraoperative anxiety compared with a no-music control group in 219 participants undergoing surgical extraction of an impacted mandibular third molar when controlling for pre-operative anxiety levels ($F = 4.226$, $P = 0.041$). Patients have been reported that the pain levels were very low in each group throughout the procedure, and therefore no between-group differences were found for pain intensity.^[21]

Advantages

Music provides the patient with an esthetic experience that can offer comfort and peace while awaiting and during dental treatment. During dental treatments, music may elicit audio-analgesic responses due to different factors, including the masking of sound, distraction, and direct neurological suppression of

pain. Music therapy can be used to reduce anxiety and also have an analgesic effect by acting as a psychological level. The mechanism of action is by releasing intracerebral endorphins and distracts the patient from painful and anxiogenic stimuli. Music reduces activity in the neuroendocrine and sympathetic nervous systems, hence resulting in a decreased of anxiety, heart rate, respiratory rate, blood pressure, and provides better sleep.

Disadvantages

Based on the study done by Prabhakar *et al.* compared audio and audio-visual device in reducing dental anxiety in pediatric patients. The results showed that the audio-visual distraction technique is more effective in managing anxious patients than audio and normal dental setup.^[22] Music therapist availability and cost is yet to determine. Findings to date are inconclusive regarding the efficacy of music as an anxiolytic intervention in dental care, especially for pediatric patients.

Clinical guidelines for the use of music listening by dental practitioners in their practice.^[23]

Patient-preferred Music

- At the time of scheduling the dental appointment, office staff should advise patients to bring their own preferred music to the appointment.
- Patients should be informed that their music selection does not need to be limited to soothing or relaxing music. Instead, patients should be encouraged to also bring music that lifts their mood and is able to sustain their attention.

Relaxing Music

- Sedative music may be found within a variety of musical styles and is not limited to classical music or new age music. It is important that the patient selects music that he or she likes to listen to.
- It is important that the music does not stimulate memories or associations that are inconsistent with the goal of relaxation.

Volume Control

- Patients should have access to the music's volume control to prevent discomfort and to maximize perceived control.

Usage of Headphones or Free Field

- Patients should be given the option to listen to the music through headphone or listen to it free field.
- When using headphones, the music volume could be kept low to enable communication.

Timing of Music Intervention

- It is important that music listening is started before the onset of dental treatment, whenever possible.

This may help prevent anxiety from building as the patient is awaiting the start of treatment.

Active Engagement

- It is recommended that patients are instructed to actively focus on the music rather than merely listen to music. In addition, brief relaxation instructions can be given to the patient to be used during music listening.

Television

Nowadays, in almost every dentist's office, you can find a television in the waiting rooms. Television screens are frequently placed in areas where patients sit before their appointments. However, even though these screens may look similar in each office, some of them perform very different functions than others. Some dental waiting room televisions are positioned to do more than air the local news. Television can be used to decrease anxiety in the patient before dental treatment. The type of content aired on dental waiting room television can be the difference between a screen that serves as standard office embellishment or a tool that helps patients relax while they wait.^[24]

With the right content, televisions in a dental waiting room help to reduce patient's anxiety by:

Explanation and Education

Content can ease patient nerves by informing audiences. Patients are more calm and relaxed when they are prepared for their appointment and have information about their dental care. Television content that offers a step-by-step breakdown of an appointment process introduces key staff members, and explains tooth care can help patients feel more in control, and therefore, less stressed.

Engagement and Entertainment

Interesting content that patients enjoy also decreases patient stress as it takes their mind off the upcoming appointment. If a patient is nervous, sitting and thinking about their appointment is going to make them more nervous. Engaging, fun, and entertaining content pulls back anxiety by giving audiences something that makes them laugh, holds their attention, and helps them relax.

Patients are less likely to stress when presented with educational and entertaining television content while they wait for their dental treatment.^[24]

Advantages

Decrease perceived wait time

When digital signage is present in a waiting room, it makes the wait feel shorter. A patient who is engaged with content on a screen will feel like they have waited for 20 min even if they have actually waited for 30 min.

Reinforce branding

Digital screens provide an opportunity for a practice to continually present their brand to waiting patients. They can feature branded content on the screen to keep their messages and branding in front of audiences at all times.

Elevate brand positioning

As a practice in the health-care field, you want to show patients that your business is performing at the highest level and using the best tools and technology. Digital content offerings allow dentists to show off their brand as a premium option that uses the best, most advanced technologies.

Save money on print signage

Dental waiting room televisions allow a practice to update and change the content; a practice can stop ordering new versions of print signage. They can simply update the advertisements in their content to promote to waiting patients.

CONCLUSION

The audio-visual aid is an effective tool in providing anticipatory guidance for the convincing patient for dental procedures. Audio and audio-visual distraction techniques provided an effective reduction in dental anxiety. Audio-visual distraction video eyeglasses are a method of behavior management leading to improved comfort and cooperation during dental restorative procedures in selected cases where nitrous oxide sedation cannot be used. Unlike already existing educational materials, this audio-visual aid provides a comprehensive, self-directed, and evidence-based approach to the promotion of the well-being of a patient's oral health. Widespread application of this prevention protocol is expected to result in greater awareness, increased usage of dental services and this, in turn, will reduce the incidence of preventable oral disease in the target populations in the near future.

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