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RESEARCH ARTICLE

HOLISTIC DENTAL APPROACH FOR VISUALLY IMPAIRED CHILDREN: A NARRATIVE REVIEW

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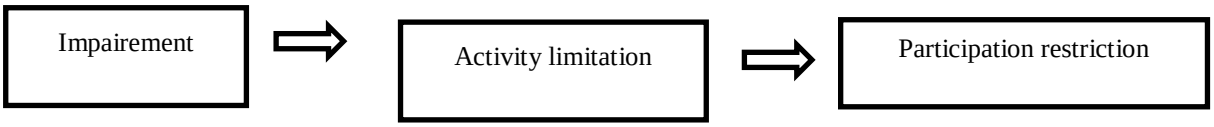
Abstract

Visual impairment is one of the most common disabilty. It requires a lot of attention especially in the field of dentistry. These children are often deprived of oral health care needs due to dental neglect. This is a comprehensive review that focuses on prevalence, etiology as well as treatment modalities for these children. It comprises barriers to dental health and various methods which can be used to overcome the challenges.

Introduction:-

Health is a state of complete physical, mental, and social well-being, rather than solely the absence of disease (WHO). [1] Optimal quality of health is a basic right as well as an essential need of an individual. The oral cavity is a gateway to general health and a mirror for overall well-being. It is one of the most crucial components of general health. [2]

As it is rightly said by Stephen Hawking “disability need not be an obstacle to success”. Disability in any individual is solely a matter of perception. According to WHO, disability is any present condition of the body or mind (impairment), due to which, an individual is unable to do certain day-to-day activities. It inhibits an individual to make vital relations with the world around them.



According to the World Health Organization, disability has three dimensions:[1]

1. Impairment: It is defined as deviation from a normal person’s body structure or function or mental functioning; examples of impairments include loss of a limb, loss of vision, or memory loss.[1]
2. Activity limitation, means the inability to perform activities of routine due to impairment such as difficulty seeing, hearing, walking, or problem-solving.[1]
3. Participation restrictions in normal daily activities, such as working, engaging in social and recreational activities, and obtaining health care and preventive services.[1]

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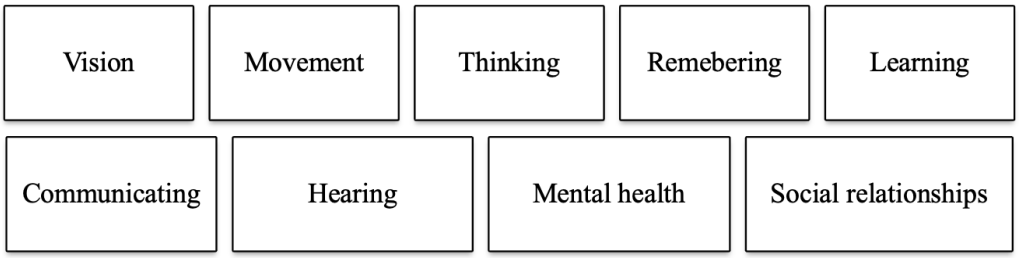

Fig1:- Acording to WHO there are various types of disabilities, such as those that affect a person's.[1]

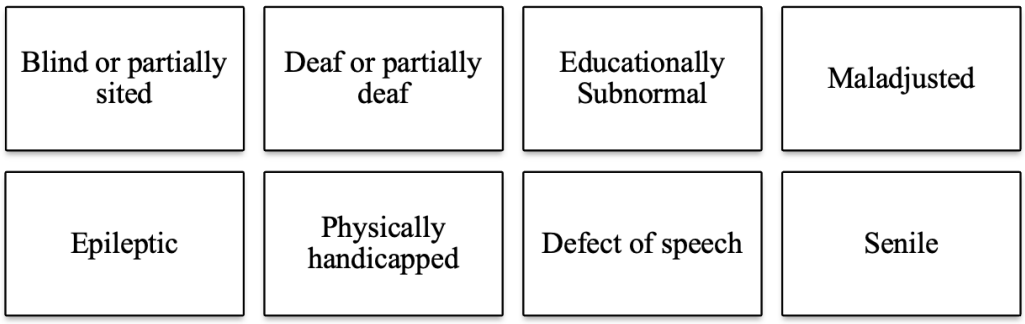

Fig 2:- Franks and Winter gave a classification in 1974 and dvided special children into [4]

Disabled children are equally entitled to an exciting and brilliant future. Children who require special care are said to be at higher risk from an oral health perspective.[3] Due to limited manual dexterity, they are often at a higher risk of oral health diseases. Due to poor oral health quality index, they frequently encounter painful dental conditions. Along with lack of manual dexterity and inability to perform their routine themselves, the presence of systemic illness also plays a major role. [4]

Prevalence:

Vision is the utmost vital sense for interpreting the environment around us, and when sight is impaired in childhood, it can have detrimental effects on physical, neurological, cognitive, and emotional development. [5] The WHO estimates that there are 40 million blind persons in the world and among them over 15 million are in India.[1] Visual impairment is considered to be a priority issue globally. The most recent estimates indicate 285 million people with visual disabilities in the world: 39 million are blind, and 246 million have a low vision [6]. According to the National Program for control of blindness & visual impairment (NPCBVI), India, the prevalence of blindness in all age groups was found to be 0.36%. An additional survey was conducted in the 0-49 years age group in Jan-Feb 2019. The survey included 6 districts selected from six zones (north, south, east, west, central, and northeast) of India. The results of both surveys, in the 0-49 age group and≥ 50 years population, were used to estimate the prevalence of blindness and visual impairment in India across all age groups.[7]

Etiology:

Prenatal causes[8]

Optic atrophy	Cytomegalic inclusion disease
Microphthalmos	Syphilis
Cataracts	Rubella
Colobomas	Tuberculous meningitis
Dermoid and other tumors	Developmental abnormalities of the orbit

Postnatal causes[8]

Trauma	Retrolental fibroplasia
Premature birth	Premature birth
Bleeding disorders	Leukemia
Hypertension	Polycythemiavera
Diabetes mellitus	Glaucoma

***Major causes of visual impairment in less than <50 yrs in %**	
Refractive error	29.6
Cataract	25.4
All globe/ CNS abnormality (Amblyopia)	15.5
Corneal opacity	14.1

***According to National programme for control of blindness & visual impairement (NPCBVI)**

***Major causes of visual impairment in less than 0-49 yrs in %**	
Corneal opacity	37.5
All globe/ CNS abnormality (Amblyopia)	25.0
Phthisis	12.5
Other/undetermined	25.0

***According to National programme for control of blindness & visual impairement (NPCBVI)**

WHO classification of visual impairement

This is based on the corrected visual acuity in a btter eye.

V/A 6/6 – 6/8	Normal
V/A 6/18 – 6/60	Visual impairement
V/A <6/60 – 3/60	Severe visual impairement
V/A <3/60 – NPL (no perception of light)	Blind

Association between Oral health and visual impairment

Dental caries is one of the most prevalent infections of the oral cavity. If not treated in time leads to endodontic infections. The majority of oral infections follow improper oral hygiene measures. An ounce of prevention is worth a pound of cure. Therefore, our focus in special children should be on preventing the disease. We should intervene before the onset of infection to provide these children a pain-free oral cavity.

Prevalance of oral diseases in visually impaired children

There is an abundance of literature that explains the high prevalence of dental caries and periodontal infection in visually impaired children.

A study conducted by Shetty V et al, 2010 examined 222 children residing in south India with visual impairment. It was concluded that the majority of children had compromised oral hygiene. In terms of dental caries, and overall high prevalence was noted. Even more alarming outcome was that majority of carious teeth were untreated. Their oral cavity was affected by periodontal conditions like gingivitis. [10]

Suresan V et al, 2017 assessed multiple parameters like dental caries, oral hygiene status, trauma due to dental injuries, and facilities for basic oral health care in Eastern Odisha. Similar conclusions were drawn from the previous study. The unmet dental needs of these children make them fall into the category of dental neglect. [11]

Singh A et al, 2017 evaluated oral health-related quality of life (OHRQoL) of 423 children between the age group 9-15 yrs with impaired vision. Child-Oral Impact on Daily Performance (C-OIDP) questionnaire was used for the assessment. The study concluded that there was a high prevalence of dental caries (57.7%). Traumatic injuries involving dental tissues were approximately 50%. Abnormalities in occlusion were also noted. 61.5% of children had crowded dentition. The most common problem reported by the patient/caregiver was toothache. The above findings were suggestive of definitely negative OHRQoL. [12]

Although traumatic dental injuries in children have been studied vastly according to Munot H et al, 2017 in the case of children with visual impairment is the road less taken. Visually impaired children tend to have more accidents than other children during the early years while they are acquiring motor skills. The result of the study indicates that the risk of TDI for these children is greater.400 children were included in the study and the most common tooth involvement was seen with maxillary central incisor. It was concluded that it is extremely important to create awareness, educate the children as well as caregivers. Even the most important, yet neglected aspect was periodic screening which should be kept in mind. [13]

Dental management of visually impaired children

Oral health of disabled patients is frequently recognized as secondary importance to the debilitating disease, according to what is commonly referred to as a "halo effect". Children with visual impairment/ blindness have numerous hurdles in performing their daily activities. Maintaining oral hygiene is one of the many challenges faced. It requires special attention, empathy, patience, and specialization to help these children. Overall it requires a multidisciplinary approach throughout lifetime. [14]

Various oral conditions associated with visual impairment are calculus because of compromised gingival and periodontal conditions. Enamel. Hypoplasia, dental caries, various behavioral problems in and outside the dental operatory, most common malocclusion problem as dental crowding, various anomalies associated with the shape and size of a tooth. Behavioral issues come in handy with problems like bruxism and wear facets which make the teeth more sensitive. These children tend to have more dental trauma due to falls. [15]

American association of pediatric dentistry (AAPD) has laid out basic steps which should be followed for easy and smooth management of children with special health care needs. [15] [16]

1. Establishing dental home
2. Scheduling dental appointment:
3. Patient assessment
4. Medical consulations
5. Patient communication
6. Planning dental treatment
7. Informed consent
8. Behavior guidance
9. Pevent strategies
10. Barriers to good oral health
11. Proper and meaningful referals

Establishing dental home:

The concept of a dental home was initiated by AJ Nowak. [17] AAPD, 2004 defines a dental home as a relationship between the dentist and the patient which includes all the aspects of oral health care. It aims to deliver complete, continuous, and accessible approaches which are very coordinated and family-centered. Establishing a dental home at or before the age of 12 months can prevent several oral diseases which are solely initiated by dental neglect. It also includes proper referral and parent education and motivation. [18]

Scheduling dental appointments:

During the first appointment, the dentist and the team should be able to build a rapport with the caregiver and as far as possible with the patient. Along with the name of the child's age and chief complaint, the dentist should assess the status/ degree of blindness. This will help in formulating a tailor-made treatment plan. As every child is unique, so will be the treatment protocol. A behavioral assessment should be done and if any extra modifications are needed to make the patient comfortable. The duration of the appointment should be short and the time of the appointment should be preferably mornings. (Limited patients in the waiting room, the patient is active during the first hours of the day).[19]The privacy policy of the patient should be maintained and proper documentation should be done. Informed consent is of utmost importance in such cases. [20]

Any specifications given by the parents should be considered. For example, if the child prefers to be accompanied to the dental chair or will walk on its own, etc)

Patient assessment: The dentist should be very well aware of the patient's past medical history. This helps to decrease the possibility of aggravating the medical condition during any dental procedure. The basic points to be considered are as follows: [21]

Information regarding chief complaint

1. History of present illness
2. Medical conditions and and medical care provider
3. Allergies and status of immunizations
4. Family history

5. Dental history

At each visit, the history should be updated with past and present medical records. Comprehensive documentation is of extreme importance. Following which a caries risk assessment should be done periodically. Assessment involving the periodontal status as well as any traumatic injuries should be included. [22]

Medical consultations:
There should be clear communication between the dentist and the medical care providers. Appropriate referrals need to be made if needed. If the cooperation level of the patient is low and dental treatment demands the patient to be sedated or under anesthesia, clearance from the pediatrics department and the anasethologist is very crucial. This will help us to deliver safe dental care to the patient.

Patient communication:
The most important thing in communication is to hear what isn't being said. In the case of visually impaired children, good communication bridges the gap between emotions like insecurity, confusion, fear to feeling more secure, clarity of situation making the child fearless. [23]

Information given before dental treatment by the patient, caregiver, physician, psychiatrist plays a major role in the smooth delivery of dental duties. Determining the degree of visual impairment.

(Can the patient tell light from the dark?). If the patient is accompanied by a companion, find out if the companion is an interpreter. The patient might not communicate verbally or be unable to see but will have various other ways of expressing. Before initiating any dental treatment, the patient should be introduced to the dentist and the team. [24]

Thereafter, introduction to dental operatory. As it is rightly said if a person lacks one sense organ the brain concentrates on remaining sense organs and these sense organs become more sensitive. [25]

Planning dental treatment with informed consent:
The treatment plan should be tailor-made as per the requirements of each individual. An informed consent holds a very important role to avoid any medico-legal complications. Therefore, abiding by the law and protocol is the best way to proceed with any dental intervention. Consent should be signed and documented in each appointment. [24] [20]

Behavior guidance and modification:
The behavior of a child can pose a challenge and when it comes to a special child it can be even more demanding. Because the inability to see completely or partially makes the patient apprehensive and fearful. Sudden changes in the environment and different types of noises are stimulating for the patient. Therefore, special techniques should be used to overcome these difficulties. A conventional tell-show-feel-do approach, can be changed by touch-feel/taste/smell-do. [23]

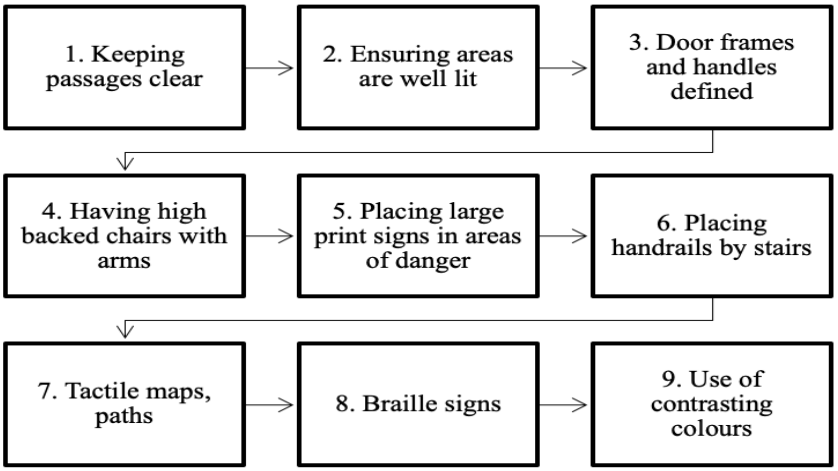

Fig 3:- Royal National Institute for the Blind. Ill Informed. Campaign Report 7. London: Royal National Institute for the Blind, 1995.

Preventive strategies:
Limited ability to perform daily activities make them more vulnerable to oral diseases. Therefore, the key is prevention. Oral health education to parents/caregivers as well as patients emphasizing the importance of good oral hygiene and even more on toothbrushing technique, frequency of brushing, duration of brushing, etc.

Recommendations for toothbrushing with fluoridated toothpaste daily to prevent dental caries and infection of gingival and periodontal tissues.If the taste/texture of toothpaste is not acceptable by the patient, fluoridated mouthwashes should be prescribed. Recording the diet history of the child and focusing on an anti-cariogenic diet for long-term prevention. Other non-invasive methods like professionally applied topical fluoride and pit and fissure sealants on newly erupted teeth can largely prevent dental decay. Prevention of dental injuries also holds equal importance. Lack of vision and sometimes compromised motor skills make these children prone to fall, therefore, education on prevention is vital. [6]

Children with disabilities are found to be more vulnerable to dental neglect, physical and sexual abuse. According to a study conducted by Giardino P et al, 2003 largest referrals came from child protective services of children with special health care needs.[26]

Techniques and innovations for dental treatment:
Newer advancements have been made to understand the needs of patients with visual impairment to deliver good oral health services. Aids like the favorite audio song of the child, braille booklets, and tailor-made treatment plans are found to be extremely helpful.[27]

Children with visual impairment have a good tactile sensation. Therefore, aids like plaster models of teeth, embossed images on a microcapsule paper, and pre-recorded instructions for oral hygiene maintenance are proven to be fruitful.[28]Shetty V et al used exclusively designed models and tooth-brushing was taught along with specially formulated music-aided instructions in a song format. The levels of oral health status (OHS) and oral health education (OHE) were evaluated before and after the intervention. The study turned out to be effective in improving the OHE and OHS of individuals.[29]

ATP technique:
It stands for Audio tactile performance (ATP) and helps children with visual impairment to overcome challenges in learning everyday skills. It is a smart method for health education, exclusively designed to educate these children about oral hygiene maintenance. Joybell C e al conducted a study using ATP on children with visual impairment. Two brushing methods i.e. fone's and modified bass method was taught to these children using the above method. They concluded both the techniques were comprehended by the patients. Also, there was an increase in the frequency of tooth brushing following training.[30]

Barriers to good oral health:
Barriers can initiate from lack of access to dental treatment to lack of interest of care providers to take that extra step for them. Special children especially those with visual impairment need constant guidance and support. Bhandary S et al, 2012 studied the knowledge of caregivers regarding the oral health of children with disabled vision. It was conducted through a simple questionnaire and concluded a clear lack of awareness of caregivers. Therefore, it is our duty as a dentist to motivate and educate caregivers as well.[31]Another barrier often neglected yet very important is the lack of interest of dentists to treat such patients. These children often need professional help with experience and expertise.[32]

Role of an orthodontist in treating malocclusion:
1. The prevalence of severe orthodontic problems in children with special needs is quite significant.
2. There have been increased cases of anterior open bites, dental crowding, crossbites, etc. which require immediate referral to orthodontics.
3. After the completion of the growth phase of a child, where fixed orthodontics is the only viable option left, a proper referral should be made.
4. It has been noted that orthodontic services have often been neglected by practitioners. Therefore, acceptance by the orthodontist and management of such patients should be of utmost priority. [33]

Role of a pediatricdentist:

1. A pediatric dentist has a better understanding of child psychology. They are professionally trained for children with special health care needs.
2. Pediatric dentists are well-versed with the recent advances in behavior management as well as skills needed for implementation.
3. Pediatric dentists have special interests in treating these children by the use of braille charts, embossed models, for alleviating anxiety and educating the patient.
4. They are best at promoting preventive strategies for these patients.
5. They are aware of the difference between being empathetic and sympathetic and are masters at a technique known as TLC tender love and care.

Recommendation:-

for caregivers and patients:

1. Daily oral hygiene practices with a toothbrush and fluoridated toothpaste twice daily under supervision once after breakfast and second just before sleeping at night.
2. A medium/soft-bristled toothbrush should be used.
3. Under supervision and support tongue cleaning should also be a part of routine and use of dental floss for 8 years and older children.
4. Maintain diet diary and discourage in-between snacking. Sugar consumption should be reduced and if consumed thorough mouth rinse should be done
5. Periodic dental checkup i.e. at least every 6 months
6. Periodic dental checkup i.e. at least every 6 months
7. Be a patient listener. Be free from any kind of guilt and social anxiety

Conclusion:-

The purpose of this review is to highlight that general health and oral health are parallel to each other. The good oral cavity serves as a mirror to the human body. Children with visual impairments are at increased risk for oral diseases. This directly affects their overall well-being. Dental care for these children has been given less attention by their families and health professionals. As someone wise said, “even without sight there is still vision”. We as dentists can be of so much help just by crossing some extra miles for these children because our eyes will be useless if our minds are blind.

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