



ORAL HEALTH STATUS OF VISUALLY IMPAIRED CHILDREN IN BENGHAZI, LIBYA

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**THIS THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
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University of Benghazi

Faculty of Dentistry



DEPARTMENT OF PEDIATRIC DENTISTRY

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DECLARATION

I declare that this thesis is an individual work which there was no unethical behavior during all the stages from planning the thesis until its writing. I declare that the information in this thesis was obtained according to academic and ethical rules and it is original. I declare that I have referenced all the interpretations not obtained in this study and that these sources are listed in Reference list. I declare that there is no violation in the samples or the working or the writing of this study.

DEDICATION

This research is lovingly dedicated to my wonderful supportive family and those who supported me throughout this journey.

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The candidate

Rania Bu Khazam

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LIST OF ABBREVIATIONS

CDC.....	Central of Disease Control and Prevention.
DMFT.....	Decayed, missed and filled for permanent teeth.
dmft.....	decayed, missed and filled for primary teeth.
DMFS	Decayed, Missed and Filled tooth surfaces.
ICD	International Classification of Disease.
WHO.....	World Health Organization.
ROP	Retinopathy of prematurity.
AAPD.....	American Academy of Pediatric Dentistry.

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ABSTRACT

Introduction: Visual impairment is a serious global problem with approximately 14 million children are blind and 1.5 million children consider to be visually impaired. Keeping a good oral health has been a challenge in this population. Maintaining good oral hygiene is one of many daily living tasks that visually impaired children struggle to learn. Therefore, it is important for visual impaired children to practice an oral hygiene in order to minimise the risk of oral health problems.

AIM: This study aimed to evaluate the oral health status of school aged visually impaired children in comparison to sighted children in Benghazi, Libya and to compare the oral health knowledge of their parents/caregiver before and after oral hygiene instructions.

Methods: Cross sectional study that included 44 visually impaired and 102 sighted students aged 6-15 years old. The study was conducted in two separate periods of time (phase1 and 2). In both phases, a survey was completed by the parents/guardians, oral health examination, Assessment of dental caries, gingival health, dental plaque and dental calculus to evaluate the oral hygiene for each subject.

Results: Showed that the visually impaired children had relatively higher average dental caries experience than their healthy control group, though it was not statistically significant ($P>0.05$).

Likewise, the score for gingival index and debris index were higher among visually impaired children but not the scores of calculus index which was relatively higher among healthy children. In Comparison of average gingival index score before and after received the oral hygiene instructions. It is clear that there is a marginal decrease in the average score following the provision of oral hygiene instructions. All differences were not statistically significant.

Conclusion: Visually impaired children have poor plaque control, gingivitis, and dental caries, as well as difficulty obtaining health care professionals. In order to reduce plaque and avoid caries, they require substantial oral health education programs. Physical, social, or informational barriers associated to the visual impairment or accompanying medical problems, as well as, a lack of information in an appropriate format may affect oral health.

Key words: Visual impairment, Blindness, Oral health, Oral hygiene, Caries experience, Dental plaque, Gingivitis.

1. INTRODUCTION

Visual impairment is a type of sensory impairment that can range from complete blindness to a minor limitation in the form, distance, color, and size perception¹. The total number of people living with visual impairment worldwide is 253 million, with 217 million having moderate to severe vision impairment and 36 million being blind¹. Nineteen million children are projected to be visually impaired, with 1.4 million suffering permanent blindness who require access to vision rehabilitation treatments in order to maximize function and decrease impairment. The vast majority (75 percent) of infants who are born blind are from the world's poorest countries, mostly in Africa and Asia¹.

Oral health contributes to self-confidence and general health. Usually, children acquire their oral care habits as they grow up and carry them on into adolescence and adulthood². Therefore, it is important for children to practice oral hygiene at an early age and maintain it throughout life in order to minimise the risk of oral health problems. Keeping a good oral health could be a challenge for children with disabilities, especially in the visually impaired population. Some of these challenges are due to absence of hands and eye coordination, inadequate supervision by parents or caregivers, child's ignorance towards their appearance and lacking of manual skills for effective tooth brushing³. According to previous studies, there was a correlation between oral hygiene and disability, which showed that visual impaired children had poor oral hygiene compared to sighted children⁴.

6.

the oral health of visually impaired children has been shown to be generally poor. It was observed that there was a general link between visual impairment and dental caries³. These children were also more likely to develop gingivitis. The reason was attributed to their incapacity to notice and control dental plaque⁶.

In general, disability is an umbrella term that includes problem in body function or structure, difficulty by an individual in executing a task or action or problem experienced by an individual in involvement in life situations. There are two main theoretical models for disability, for instance, The medical model where disabilities are viewed as a personal issue that must be addressed by a team of health care specialists who provide individualized therapy for each patient. When it comes to managing a handicap under the medical paradigm, the goal is to achieve a "cure," or at least an "almost-cure" or an "effective cure". Then there is the social model of disability which views the issue of "disability" as one that has been produced by society and as one that must be addressed in order for individuals to be fully integrated into society. According to this approach, disability is not a characteristic of an individual, but rather a complex collection of variables, many of which are influenced by the social context in which the individual lives. In order to handle the problem, social action is required, and it is the collective duty of society at large to make the environmental adaptations necessary to enable persons with disabilities to participate fully in all aspects of social life on an equal basis with their peers⁴. Around 15% of the world's population Lives with some form of disability of which 2-4% experience significant difficulties in functioning⁵. Disability is more complex among children. Visual impairment and hearing impairment constitute a significant proportion among all disabled children⁴.

Visual impairment is a type of disability that refers to the decrease in the ability to see to an extent that it might cause a problem that is not treatable even by

using glasses⁶. Based on the International Classification of Disease (ICD), visual impairment can be classified into low vision (6/24 – 2/60) and near blindness (1/60 – No perception of light-NLP). It ranges from total blindness to limitations of the size, color, distance and shape⁶.

Based on statistics, visual impairment is a serious global problem. In 2018, the World Health Organization (WHO) had estimated that about 1.3 billion people worldwide live with some form of visual impairment whereby about 188.5 million people suffer from mild vision impairment, and 217 million suffer from moderate to severe vision impairment⁷. Out of those affected people, approximately 1.5 million children were blind. It is concerning that by 2020 this number will double. 75% of these children live in developing countries especially in Africa and Asia⁸. In some of these poor countries the rate of visual impaired children exceeded 0.15%. It is worth mentioning that the main causes for blindness during childhood are congenital malformation or intrauterine infections such as rubella and toxoplasmosis⁷.

In light of this background, it is important to identify the oral health related needs and practices as well as barrier and related factors among children suffering from visual impairment. This is the first step in establishing oral health program for such a special need group. This will also provide a baseline data for health planners and educators.

2. ITTERATURE REVIEW

2.1. DEFINITION OF VISUAL IMPAIRMENT

The majority of a child's early learning is accomplished through visual perception. Eye health therefore becomes a very essential component of a child's growth and general well-being. A person is deemed blind if their visual acuity in the better–corrected eye is less than 20/200 or less in both eyes. This means that legal blind person with 20/200 visual acuity can see at 20 feet, the average person can see clearly at 200 feet. And for visual field ,the average person can see 140 degrees without turning the head⁹

Visual impairment is divided into two categories based on the degree of vision loss. First, totally blind, when a person can receive no useful information through the sense of vision and must use tactile and auditory senses form to learn. Legal blindness is another phrase that is used in some nations (e.g., the United States) to describe this group of people⁹. Visual impairment in the educational setting has been characterized as a loss of visual acuity and field that impairs a child's performance in an educational environment necessitating the need of special education services¹⁰. Even if a student is able to supplement information from other senses and perform certain tasks like mobility in the classroom with their limited vision, they are classified as totally blind when they are unable to receive any useful information through their sense of vision and must rely on tactile and auditory senses. Second, a person is considered to have low vision when a person can use visual information with tactile and auditory input¹⁰.

2.2. VISUAL IMPAIRMENT'S ETIOLOGY

There are hundreds of thousands of blind youngsters in Africa today, according to estimates. A total of 419,000 African youngsters were predicted to be blind in 2019¹¹. It is estimated that vitamin supplements, immunization, refractive treatments, and surgery to maintain or restore sight can prevent or treat around 50% of infant blindness in Africa¹². Globally, the World Health Organization believes that 80 percent of all blindness is avoidable¹³. An estimated 1.4 million children are blind. According to an estimation, children who are blind are more likely than their counterparts to grow up in poverty, to be hospitalized more frequently throughout childhood, and even to die during childhood, compared with children who are not blind¹⁴.

In Africa, children's vision impairment can be caused by a variety of factors, some of which are more prevalent in some regions than others. Socioeconomic progress and the availability of basic eye health care both play a major role in these factors¹¹. Lesions of the upper visual pathway and of the optic nerve are the most common causes of blindness in high-income nations. It's estimated that retinopathy of prematurity (ROP) is the leading cause of blindness in middle-income nations¹¹. In low-income countries, the most common causes of blindness are corneal scarring from measles, vitamin A deficiency, dangerous traditional medicines, and ophthalmia neonatorum, inherited retinal dystrophies, cataracts, and other birth defects¹³.

In Libya, one of the most common causes of poor vision and blindness in school age children is refractive error. In Derna, Libya, a study was performed in

2017 on 1000 students from 10 public schools in the area. It showed that the prevalence of refractive error was 11.6 percent. This result was greater than the prevalence of refractive error in the nations in the same region¹³. The author provided reasons for this high prevalence rate by stating that this city's system for treating and managing people with vision impairments is far from ideal. Ophthalmic services and tools are severely lacking for patient diagnosis, treatment, and follow-up¹³.

2.3. DENTAL CARIES IN GENERAL

Dental decay is another term for dental caries. It's the most prevalent disease in the world's population, according to the Center of Disease Control and prevention (CDC)¹⁵. Approximately one in every five (20 percent) youngsters between the ages of 5 and 11 years old has at least one untreated decaying tooth¹⁵. This percentage is reduced to 12 percent in teenagers between the ages of 12 and 19. Dental caries are twice as common in low-income children (5-19 years old) as they are in high-income children (25 % and 11% respectively)¹⁵.

Dental caries may be prevented in primary teeth by the use of fluoride varnish. This can prevent approximately 33% of dental caries¹⁵. Statistics from the CDC showed that kids who live in towns with fluoridated tap water have less dental caries than those who don't¹⁵. Tooth decay is reduced in youngsters who use fluoride toothpaste on a regular basis as well¹⁵. Studies revealed that the use of fluoride toothpaste protected against the development of dental caries in visually impaired children. The American dental Association has acknowledged that utilizing the optimum amount of fluoride can prevent the development and

progression of dental caries¹⁶⁻¹⁸. Another method to prevent dental decay in children is through the use of dental sealants. This method have been shown to keep teeth free of dental caries for up to ten years after they are placed^{15,19}.

Dental caries occurs in all part of teeth and can manifest as a severe form of tooth decay in babies and toddlers' primary teeth during early childhood. A systemic review of 77 studies was performed to evaluate the factors that increase dental caries among children in the Middle East and North Africa region²⁰. The review concluded by stating that there are several variables involved in the formation of dental caries in this region including environmental ones such as socioeconomic status, tooth brushing frequency, low parental involvement, poor oral habits, insufficient fluoride exposure and sugar consumption²⁰. In general, dental caries form over time as a result of a complicated interplay between acid-producing bacteria, fermentable carbohydrate, and several host components such as saliva and teeth²⁰.

2.4. PLAQUE IN GENERAL

A key step in the etiology of dental caries is the formation of dental plaque (biofilm), which metabolizes carbohydrates to acid, causing the loss and disintegration of tooth enamel and dentin²¹. Infection with various microorganisms leads to the development of dental caries, with the primary pathogens being streptococcus mutans²². Moreover, organic acids, which are produced by the consumption of sugars and other fermentable carbohydrates, induce a decrease in the pH level in the oral cavity. This result cause an in increase calcium hydroxide solubility in the dental hard tissue as well as enhanced calcium demineralization on

the tooth surface as a result²⁰. It is therefore possible to prevent caries development by removing plaque from the tooth surface, lowering plaque's acidogenic potential, reducing sugar consumption, increasing the tooth's resistance to plaque, and coating the tooth surface in order to create a barrier between plaque and enamel. Fissure sealants, and fluoride application are now the most appropriate treatments²⁰. Due to the fact that dental caries is a treatable disease that can be prevented, governments, communities, and people alike should take steps and implement methods to slow or stop the spread of the disease.

Overall, the buildup of plaque is viewed as a complicated and multi-factored process^{23,24}. Using a toothbrush and toothpaste is the most popular method for removing dental plaque^{25,26}. In addition to brushing, there are numerous additional aspects that contribute to oral hygiene, such as flossing and rinsing the mouth²⁷. When a child has dental caries in their primary dentition, they are more prone to have dental caries in their permanent dentition²⁸. The teeth and gums of young children must be properly cared for to ensure their health and development²⁹. During the school years, permanent teeth begin to appear. During this time, dental hygiene and frequent dental caries monitoring are essential. Students should be taught proper brushing practices and the role those fermentable carbohydrates play in the formation of dental caries³⁰.

2.5. GINGIVITIS IN GENERAL

Gingivitis, or gingival inflammation, is the most prevalent oral disease in children and teenagers¹⁴. It is described as gingival inflammation in the absence of demonstrable bone loss or clinical attachment loss. The most major local risk

factor in children is poor oral hygiene, which is a result of children's reliance on adults for routine oral hygiene support. Additionally, it originates from an age-related decline in awareness of the need of frequent and effective teeth cleaning. When plaque and food debris collect as a result of inadequate dental hygiene, microorganisms multiply and the inflammatory process begins. This results in gingivitis, which, if left untreated, can continue to the slow deterioration of the teeth's supporting soft and hard structures.

In general, gingivitis shows symptoms such as bleeding gums, edema and pain. As time goes on, the edematous part may become more fibrotic³¹. People of all ages are susceptible to gingivitis, which can proceed to periodontitis only in a small percentage of cases³². Gingivitis affects about 80 percent of children and adolescents, according to previous research^{21,33}. The prevalence of gingivitis between the ages of 6 and 11 years old in developed countries was shown to be in approximately 73 percent. This rate increases as the child's age increases specially in puberty³⁴. Gingivitis is less common in girls than in boys, which is most likely related to the amount of dental hygiene practiced by girls³⁴. A study in Chandigarh compared the bleeding scores of people who were 9-11 years old and 12-14 years old with those of people who were 6-8 years old and 15-18 years old. The 9-11 years and 12-14 years age groups had the highest bleeding scores. Bleeding index are higher in people who are visually impaired this could be because they can't see the plaque³⁵.

A study performed in Benghazi, Libya showed that the absence of regular dental care in 206 out of 208 children from Benghazi who attended the children department at the faculty of dentistry resulted in more prominent gingival inflammation of varying degrees in this group of children (78% of the study sample had GS2 degree)³⁶.

In contrast to dental caries, gingivitis has demonstrated a worldwide rise in prevalence³⁷. Numerous indices have been utilized to clinically assess the degree of gingival inflammation in children and adolescents, as well as several types of gingivitis in these age groups that have been characterized. The gingival index (GI), and plaque index (PI) are the most often used clinical indicators for assessing the severity of gingival inflammation. But it is not obvious how these measures are related to one other and to the depth of a patient's probing pocket, which is a significant predictor of periodontitis³⁸.

2.6. DENTAL CARIES IN VISUALLY IMPAIRED CHILDREN

Visual impairment can have a detrimental impact on oral hygiene, with some visually impaired persons having lower oral hygiene than their sighted counterparts. Children who are blind had more decaying, missing, or filled teeth (DMFT), according to recent studies^{3,39-41}. As well as, it has been reported that there is a general association between visual impairment and dental caries, with high DMFT/dmft scores reported among visually impaired school children^{3,42}. Thirty-five percent of the involved students aged between 9-15 years of age had degree III of caries according to the Global Oral Health Scale³. In addition, a research study that was designed to evaluate the oral health among 267 visually impaired children in Riyadh, Saudi Arabia showed significant frequency of dental caries in this study population³.

In Northeast China, a questionnaire and a clinical tooth examination were done in a study conducted on caries experience and oral hygiene status among visually impaired school-aged children⁴⁰. The result showed that only 21% of the

children were caries free. The increased frequency of caries was likely due to the fact that some of these students were moderately retarded and others had a developmental impairment⁴⁰. A second study of 50 blind and 50 sighted children aged 6 to 10 years found that 30% of the sighted children and 20% of the blind children were free of dental caries, according to the researchers. In comparison to the sighted with visually impaired children showed that the DMFT and DMFS were significantly greater among the visually impaired children ($p = .05$)⁴³.

The main hypothesis for the bad oral hygiene in this population could be due to dental care was not prioritized at their school and oral health education was not provided to the children by their teachers and caregivers.

2.7. PLAQUE AND GINGIVITIS IN VISUALLY IMPAIRED CHILDREN

There is a link between oral hygiene and visual impairment, with the general agreement being that these children have poor oral hygiene⁴⁴⁻⁴⁸. The oral health condition of the visually impaired children has been proven to be usually low when compared to that of the general population. This is could be due to that they receive less care from their parents compared to normal kids. For instance, Plaque was detected in every single kid of the children with visual impairment tested in a study from Kenia⁴⁹. However, following treatment as part of an intervention program, there was a significant drop in the plaque score, demonstrating that it is possible to implement inexpensive and effective oral health programs in schools⁴⁹. In addition, among visually challenged children, maintaining good oral hygiene poses significant problems, according to a Turkish study that examined dental

treatment experience and oral hygiene quality⁵⁰. This result was achieved by using an oral health questionnaire that was designed, and it was used to record the youngsters' overall health, socioeconomic profile, educational level of their parents, oral health awareness, source of information about oral health, and oral hygiene practices⁵⁰. Oral hygiene status was assessed using the Greene and Vermillion Simplified Oral Hygiene Index, and just 2.2% of students were found to have satisfactory oral hygiene⁵⁰.

Another study enrolled about 228 children, 128 visually impaired and 100 non-visually impaired, in research in India on the prevalence of oral health status in visually impaired children⁴⁸. The students, ranging in age from 6 to 15 years, were chosen from two schools with comparable socioeconomic backgrounds. When comparing visually impaired children to non-visually impaired children, the findings of this study revealed that they had poor dental hygiene habits. The reason was attribute to their inability to perceive and remove plaque, their lack of development of self-help skills, and they were unable to supervise themselves while cleaning their teeth⁴⁸. Because of their inability to see and remove plaque, these children are also more likely to develop gingival inflammation. Maintaining good oral hygiene is one of many daily living skills that visually impaired children struggle to learn. It is essential for blind patients to maintain good oral hygiene and remove dental plaque, which is the primary factor in the development of caries. The presence of discoloration in the teeth is a sign of dental caries. therefore, blind children are unable to detect it and see the disease process⁵¹. A study conducted in Yemen on children with different disabilities aged between 6 and 14 years shows the highest PI and GI score in blind children in compared with the deaf kids had the lowest⁵².

In a previous study, the plaque levels were higher in those who were completely blind than in those who were partially blind and there was a higher prevalence of dental caries overall, which is consistent with earlier research^{7,53-55}. Dentists face a unique set of challenges when treating patients who are visually impaired. Dentists are obligated to provide comprehensive dental care to visually impaired children, which is both rewarding and an important community service⁵⁶.

On the other hand, some investigations have failed to demonstrate a link between poor dental hygiene and vision impairment^{48,57}. For example, there were 85 students from a residential blind school in Bangalore who participated in an Indian study on oral health awareness, practice, oral hygiene status, and dental caries prevalence among elementary and middle school visually impaired children⁵⁷. During the investigation, the Principal Investigator performed a standard dental examination, followed by a verbal interrogation of the questionnaire. The result showed that 91% of the involved kids had good oral hygiene. This was related with the fact that the sample population had greater awareness about oral health as a result of their teachers informing them about the significance of oral health through basic oral health education programs, which was implemented in their classrooms⁵⁷.

2.8. ORAL HYGIEN PRACTICE AND VISAUAL IMPAIRMENT

When it comes to oral hygiene, it's all about, cleaning your teeth, how often you brush, what tools you use, what toothpaste you use, and whether or not you're using fluoride toothpaste. The goal of oral hygiene is to improve periodontal and dental tissue health through altering the oral flora. However, in periodontally

involved dentitions, wooden sticks and interdental brushes have benefits over traditional tooth brushing and flossing methods, which are more popular⁵⁸.

The horizontal scrub technique, rather than Fone's method or the Modified Bass technique, is the preferred way of brushing for these youngsters. This method's ease of use makes it preferable to other methods. Starting with the patient's present brushing method, physical and verbal counseling can help develop and correct the patient's technique⁵⁹.

Brushes with soft, rounded tips and multi-tufted nylon bristles are suitable for young children, and the size of the mouth should be taken into consideration when choosing which brush to use. When compared to manual toothbrushes, electric toothbrushes are more effective and brushing duration is approximately for roughly three minutes. The usage of a floss container can make flossing more convenient. If the caregiver is doing the flossing, floss is typically advised for plaque control. Tactile sensations can be utilized to determine where the brush or floss should be positioned inside the mouth⁶⁰. Visually impaired children's dental hygiene might be improved if they were taught using personalized approaches like the multisensory approach and imaginative use of other senses. For visually challenged youngsters the Audio-Tactile Performance Technique (ATP), a multimodal health teaching method, is a very effective communication tool⁴³.

In visually challenged youngsters, timing and frequency are two of the most critical elements for oral hygiene routines. It is best to brush teeth in the evening and immediately following last meal. Frequent brushing should be recommended in children who can brush on their own to prevent plaque formation⁶¹. Some researchers have emphasized the need of utilizing electric toothbrushes for visually impaired people to maintain excellent oral hygiene. However, another study

conducted in 2011 found that electric toothbrushes are no more effective than manual toothbrushes⁶².

The application of the toothpaste to the toothbrush, as well as the completion of the technique, is sometimes challenging for visually impaired youngsters. The parents' lack of knowledge and behavior in oral health will not assist or relieve their kid's problem of poor oral health since they don't take their children to the dentist often⁶³. Three studies found visually impaired children would only seek dental care if they were in excruciating pain; otherwise, they might assume that their oral health was fine despite the fact that it wasn't; this is compounded by the fact that most people lack the ability to visually recognize oral abnormalities^{53,54,64}.

As soon as the kid's first tooth appears, he or she should begin brushing with the help of the caregiver until they reach the age of 8 when they have developed manual dexterity and can brush independently. The use of mouth rinses, gels, and dentifrices in conjunction with mechanical methods, such as brushing and flossing, can help to enhance oral hygiene as well. Dental health methods, on the other hand, should be tailored to children and lives and skills in order to enable them to make decisions about improving their own oral hygiene and dental health⁵⁸. For their day-to-day activities, visually impaired youngsters rely largely on simple information and spoken instructions⁵⁸. Therefore, to maintain a great quality of life, it is essential to maintain good dental health. It is necessary to evaluate the oral health condition of children who have visual impairments in order to determine their health-care needs and to conduct preventative dental treatments.

3. OBJECTIVES

- 3.1. Assess of dental caries, oral hygiene, and gingivitis among visually impaired children vs. normal children.
- 3.2. Assess the oral health behaviour, awareness and utilization of dental services of their parents or caregivers.
- 3.3. Assess the effect of the oral hygiene instructions on the oral health status and the oral hygiene habitus among visually impaired children vs. normal children.

4. AIM OF THE STUDY

This study aimed to evaluate the oral health status and knowledge of school aged visually impaired students in comparison to sighted students in Benghazi, Libya and to compare the oral health status of these children and the knowledge of their parent or caregivers before and after the oral hygiene instructions.

CHAPTER TWO

4. METHODS

This was a cross sectional study consisted of 6-15 years old students. The study consisted of visually impaired students while the control group included normal students from Benghazi, Libya. A total of 146 children were selected, 44 registered in the blind children association and 102 sighted students from public schools (Al Andalus, Jamal Abdel Naser School and Alsalmane Dental center) of similar socioeconomic status, according to a survey collected from the parents. Assessment of the oral health and parent knowledge was performed for the two groups. The cohort to control ratio was 1:2 (to increase the study power) with a matching age and gender (to reduce the effect of these two confounders) for each cohort subject. In addition, a 15% increase in the sighted kids was added to overcome the possibility of loss of follow up. Prior consent was obtained from the respective schools' authorities and from the parents/guardians (Appendix1). As well as, Approval of the Ethics committee of Benghazi University was obtained.

4.1. PHASE (1)

The study was conducted in two separate periods of time. Phase (1) started on January 2020 (before the lock down that occurred due to Covid pandemic). During this phase, oral health examination was accomplished on each subject that included the total Decayed Missed Filled Teeth (DMFT) and (dmft). For each visually impaired and sighted kids, the total scores of each component was the value DMFT/dmft score. A visit to the previously mentioned schools was done and the kids were examined on a one-to-one basis. The students were seated on an ordinary chair, and under natural daylight using mouth mirror, periodontal probe,

and sharp probe. The exam was done by a single investigator to reduce measurement bias.

The recommended World Health Organization (W.H.O) examination procedure and criteria were used. The data collected was tabulated and subjected to statistical analysis.

Oral health was evaluated by assessing dental caries, dental plaque, dental calculus and gingival bleeding . In addition, the plaque and calculus were evaluated independently using the simple index (simplified index) in which Six teeth are examined 31, 11, 16, 26, 36, and 46 to determine Dental plaque and must meet the following criteria: 0 - no layering, 1 - Soft plaque covering not more than 1/3 of the tooth plane, 2 - Thin layering, located on less than 2/3, but more than 1/3 of the surface of the molar; 3 - Soft plaque, occupying more than 2/3 of the tooth plane.

The index for calculus assessment was done for mineralized deposits on six index teeth: 4 posterior teeth and 2 anterior teeth. Including the buccal surfaces of 11, 26, 16, 31 and the lingual surfaces of 36, 46 respectively. 0 - no calculus; 1 - supragingival deposition, covering no more than 1/3 of the tooth plane, 2 - the formation located above the gum, covering less than 2/3, but more than 1/3 of the tooth plane, or the presence of individual growths in its cervical region; 3 - Supragingival stratification, covering more than 2/3 of the tooth plane, or large influxes of stone located near its neck.

The Gingival Index was created for the assessment of the gingival condition and records qualitative changes in the gingiva. It scores the marginal and interproximal tissues separately on the basis of 0 to 3. The criteria are: 0= Normal gingiva; 1= Mild inflammation – slight change in color and slight edema but no bleeding on probing; 2= Moderate inflammation – redness, edema and glazing,

bleeding on probing; 3= Severe inflammation – marked redness and edema, ulceration with tendency to spontaneous bleeding. The score is then added up from the four surfaces of the tooth and then divided by four to give the index for the all plans. Finally, the index for the patient is obtained by summing the indices for all six teeth and dividing by six.

All subjects received verbal and practical instructions about ways to improve their oral health and daily dental care routine like the correct way to brush their teeth. All of that was followed by a questionnaire handled to the parents/gradiences of the subjects in both groups (appendix 2). The collected data included a section about the parents and another about the children and their oral health based on the parents' perspectives. First, the parents section asked for their general characteristics such as gender, age, career, socioeconomic status, level of education and residency address. The children section asked the parent about their kid's general health, the blindness degree, was the blindness congenital or acquired, oral health-related behaviors, tooth brushing habits, dietary habits, knowledge and attitudes about oral health care.

4.2. PHASE (2)

The second phase started on November 2020 (after the schools re-opening); subjects had re-evaluation of their oral exam after providing them verbal and practical instructions at phase (1). Same students were examined and same technique was used. In addition, the parents received the same survey to re-evaluate the presence of any change in their kids' oral behaviors compared with the phase (1).

4.3. STATISTICAL ANALYSIS

Data was analyzed using SPSS software (Version 25). The data was first uploaded on excel sheets and then transferred to SPSS software. Descriptive statistics using numbers and percentages were used to describe the distribution of study sample by participants' age, gender, degree of blindness and parental socio demographics. Descriptive statistics were also applied for behavioral and oral health related information. Comparisons of oral health indicators before and after intervention were conducted using paired tests. Paired sample t test was used for numerical values and McNemar's test was used for categorical data. All statistical test were carried out at $p=0.05$.

CHAPTER THREE

5. RESULTS

5.1. PHASE 1: ORAL HEALTH STATUS, BEHAVIORS AND TREATMENT NEEDS OF VISUALLY IMPAIRED CHILDREN COMPARED TO HEALTH CONTROLS

5.1.1. STUDY PROFILE OF VISUALLY IMPAIRED CHILDREN

The study sample comprise of 44 visually impaired children aged between 6 and 15 years of age (table 1). More than the half of participants age 12 years of older (52%), partially blind (54.5%). The majority of visually impaired children were males (59%), whose parents do not have university degree (61.4%) and come from small families (59.1%). A few children have carers other than parents (6.9%).

5.1.1.1. (Table 1): Description of visually impaired group characteristics

Variable		Number	%
Blindness	Partial	24	54.5
	Full	20	45.5
Gender of child	Male	26	59
	Female	18	41
Relation to child	Father	17	38.6
	Mother	24	54.5
	Others	3	6.9
Education of parent/caregiver	Less than University	27	61.4
	University or higher	17	38.6
Parents' age	Less than 30	6	13.6
	More than 30	38	86.4
Family size	Small family – 3 or less than 3	26	59.1
	Large family- more than 3	18	40.9
Child age	Less than 12 years	21	47.7
	12 or more	23	52.3

5.1.2. STUDY PROFILE OF CONTROL GROUP

The study sample of control groups included 102 healthy children aged between 6 and 15 years of age (table 2). The majority of children in control group aged 12 years of older (52%), males (60.8 %), whose parents do not have university degree (69.7%) and come from large families (63.5%). Most of children are taken care of by their parent who aged more than 30 years.

5.1.2.1. (Table 2): Sociodemographic characteristics of healthy children

Variable		Number	%
Gender of child	Male	62	60.8
	Female	40	39.2
Relation to child	Father	42	41.2
	Mother	56	54.9
	Others	4	3.9
Education of the parent	Less than University	71	69.6
	University or higher	31	30.4
Parents' age	Less than 30	15	14.7
	More than 30	87	85.3
Family size	Small family – 3 or less than 3	27	36.5
	Large family- more than 3	75	63.5
Child age	Less than 12 years	43	48
	12 or more	59	52

5.1.3. ORAL HEALTH RELATED BEHAVIOURS AMONG VISUALLY IMPAIRED STUDENTS VS SIGHTED STUDENTS

Table 3 describes the oral health related behaviours and utilization of dental care among blind children. More than half of the blind group reported regular toothbrushing (55%), with parental assistance (56.8%), and irregular intake of

sweets (56.9%). Most of respondents reported using soft or medium toothbrush (90%), but never used dental floss (95.5%), never brush teeth after eating sweet (88.6%) or never mouth washed (86.4%). The majority of parents (70.5%) were not aware of dental floss, took their child to the dentist (61.4%), mainly for extraction (50%) and to lesser extent filling teeth (27.3%). The majority of guardians indicated that they can afford treatment (59.1%) and tooth brushes (77.3) for visually impaired children.

For control group, more than half of the visually impaired group reported regular tooth brushing (47.1%), with parental assistance (72.5%) among the majority. Irregular intake of sweets was reported by just less than half (49%). Most of respondents reported using soft or medium toothbrush (83.3%), but never used dental floss (92.2%). Small proportion brush teeth after eating sweet (36.5%), use mouth wash (25.7%) or aware of dental floss (40.2%). The majority of parents took their child to the dentist (57.8 %), mainly for extraction (52%) and to lesser extent filling teeth (31.4%). The majority of guardians indicated that they can afford treatment (70.6%) and tooth brushes (85.3%) for normal children. Apart from parental assistance and brushing after eating sweets which were significantly higher among healthy controls ($p=0.012$ & 0.002 , respectively), no statistically significant differences were observed when visually impaired children were compared to their healthy controls.

5.1.3.1. (Table 3): Oral health behaviour among visually impaired and healthy controls groups

Variable		Visually impaired		Healthy		P value
		Number	%			
Frequency of brushing	Regular	23	55	48	47.1	0.563
	Irregular	21	45	54	52.9	
Parental assistance in brushing	Yes	25	56.8	74	72.5	0.012*
	No	12	27.3	9	8.8	
	Just supervision	7	15.9	19	18.6	
Type of tooth brush	Soft	20	45.5	44	43.1	0.332
	Medium	20	45.5	41	40.2	
	Hard	-	-	3	2.9	
	Do not know	4	9	14	13.8	
Use dental floss	Yes	2	4.5	8	7.8	0.469
	No	42	95.5	94	92.2	
Aware of dental floss	Yes	13	29.5	41	40.2	0.221
	No	31	70.5	61	59.8	
Use mouth wash	Yes	6	13.6	26	25.7	0.112
	No	38	86.4	76	74.3	
Visited the dentists	Yes	27	61.4	59	57.8	0.631
	No	17	38.6	43	41.2	
Treatment received before	Filling	12	27.3	32	31.4	0.178
	Extraction	22	50	53	52	
	Fluoride	-	-	3	2.9	
Halitosis		18	40.9	32	31.4	0.265
Able to afford treatment		26	59.1	72	70.6	0.453
Able to afford toothbrush		34	77.3	87	85.3	0.098
Eating sweets	Regular	19	43.1	52	51	0.387
	irregular	25	56.9	50	49	
Brushing after sweets		5	11.4	37	36.5	0.002*

Chi-square test was used to compare subgroups

*Statistically significant p-value <0.05

5.1.4. CARIES EXPERIENCE, ORAL HYGIENE AND GINGIVAL HEALTH BEFORE ORAL HYGIENE INSTRUCTIONS

Table 4 presents comparison of oral health indicators in visually impaired and control groups. Visually impaired children had relatively higher average numbers of decayed, missing and filled teeth as well as overall DMFT and dmft scores than their healthy control, though they were not statistically significant ($p \leq 0.05$). Likewise, the scores for gingival index and debris index were higher among visually impaired children but not the scores of calculus index which was relatively higher among healthy children. All differences were not statistically significant.

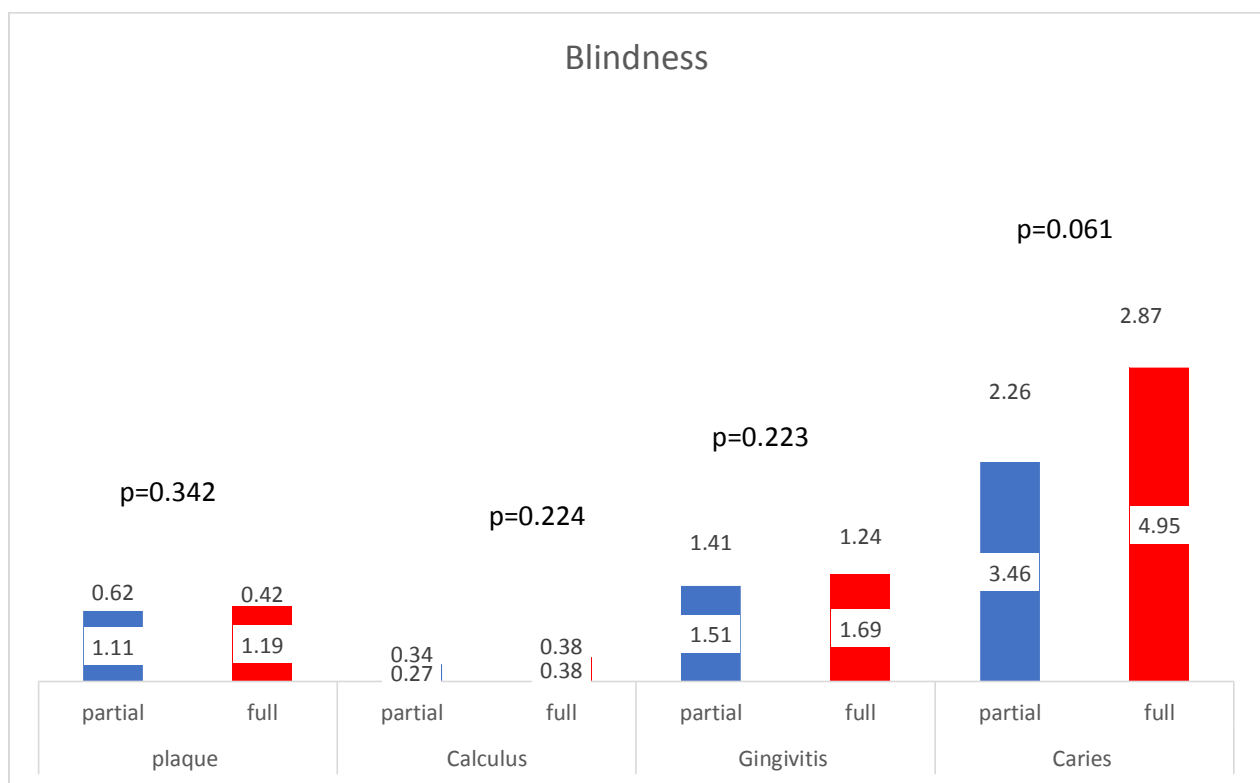
5.1.4.1. (Table 4): Caries experience, oral hygiene and gingival health

Variable	Blind Mean \pm SD	Healthy Mean \pm SD	P value
Decayed teeth	2.98 \pm 2.07	2.35 \pm 1.88	0.067
Missing teeth	0.77 \pm 0.96	0.68 \pm 0.94	0.551
Filled teeth	0.39 \pm 0.81	0.31 \pm 0.71	0.606
DMFT	4.14 \pm 2.64	3.34 \pm 2.16	0.071
dmft	5.14 \pm 2	4.5 \pm 2.19	0.1605
Debris	1.14 \pm 0.54	0.97 \pm 0.49	0.055
Calculus	0.32 \pm 0.36	0.36 \pm 0.45	0.545
Gingival index	1.59 \pm 1.32	1.45 \pm 0.90	0.449

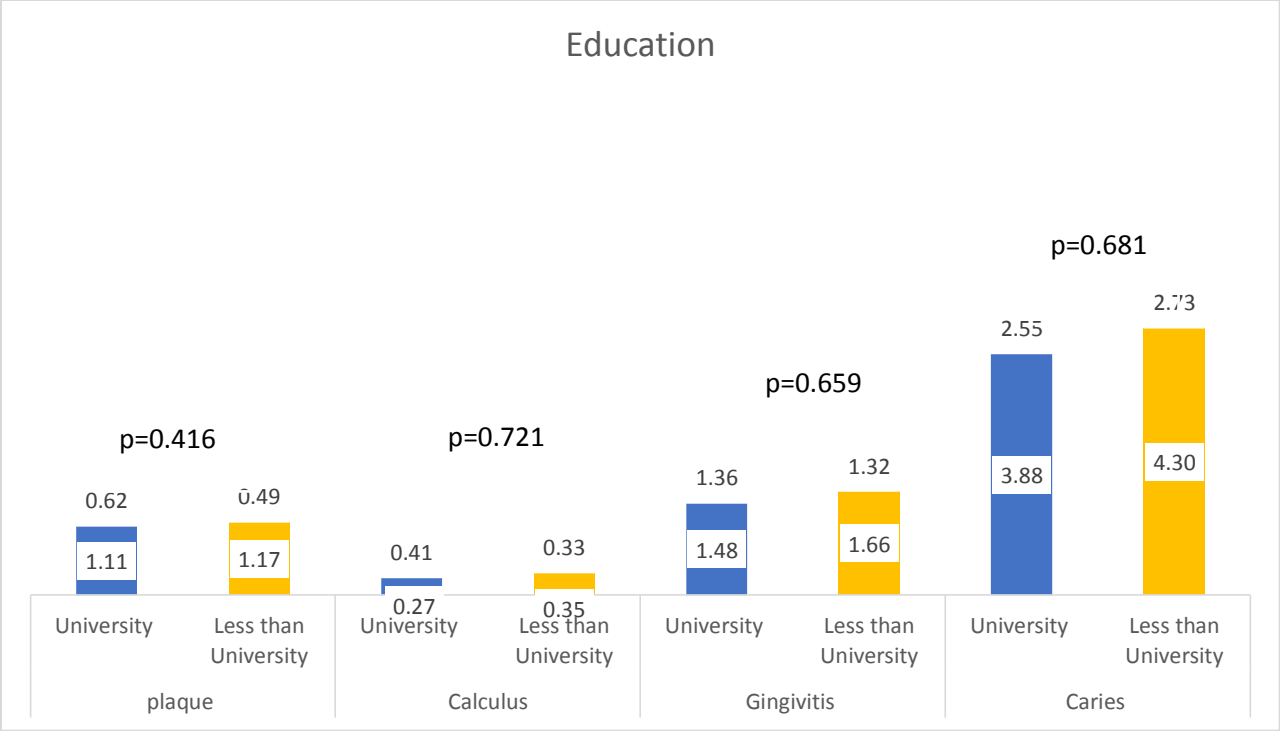
Independent sample t test was used to compare visually impaired and health controls.

*Statistically significant p-value <0.05

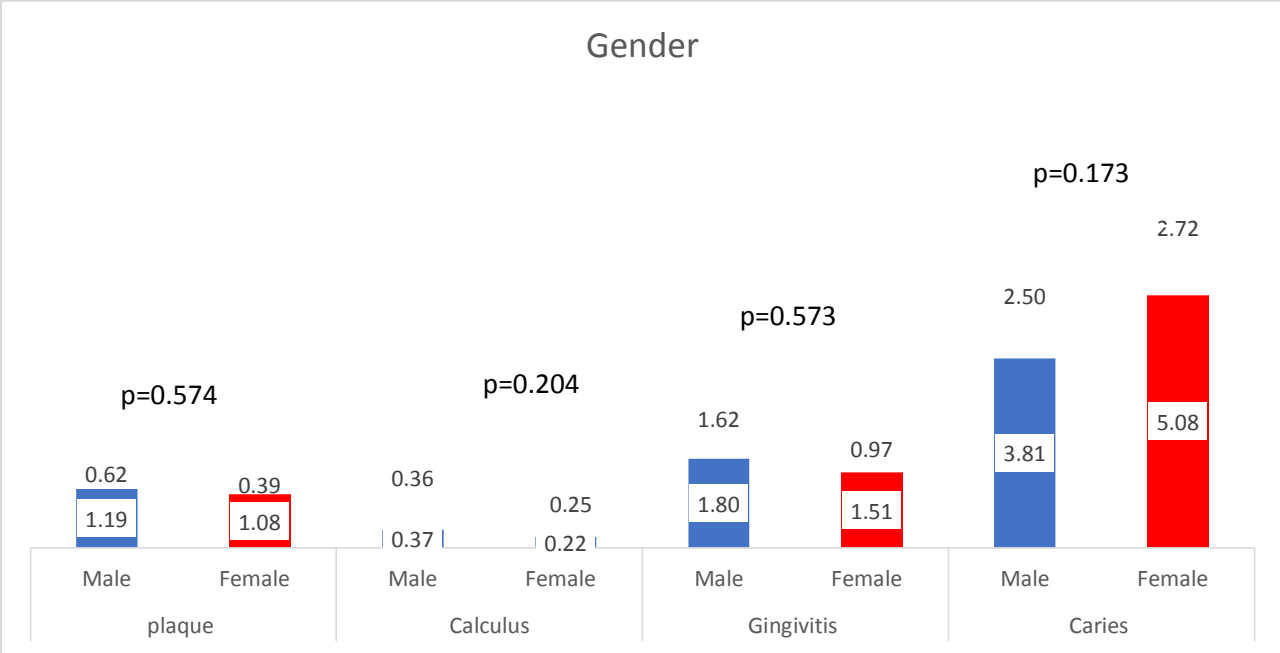
5.1.5. DIFFERENCES IN ORAL HEALTH OF VISUALLY IMPAIRED CHILDREN BY THEIR DEGREE OF BLINDNESS AND SOCIODEMOGRAPHIC CHARACTERISTICS



5.1.5.1. (Figure 1): Comparison of oral health indicators by degree of blindness



5.1.5.2. (Figure 2): Comparison of oral health indicators by parental education



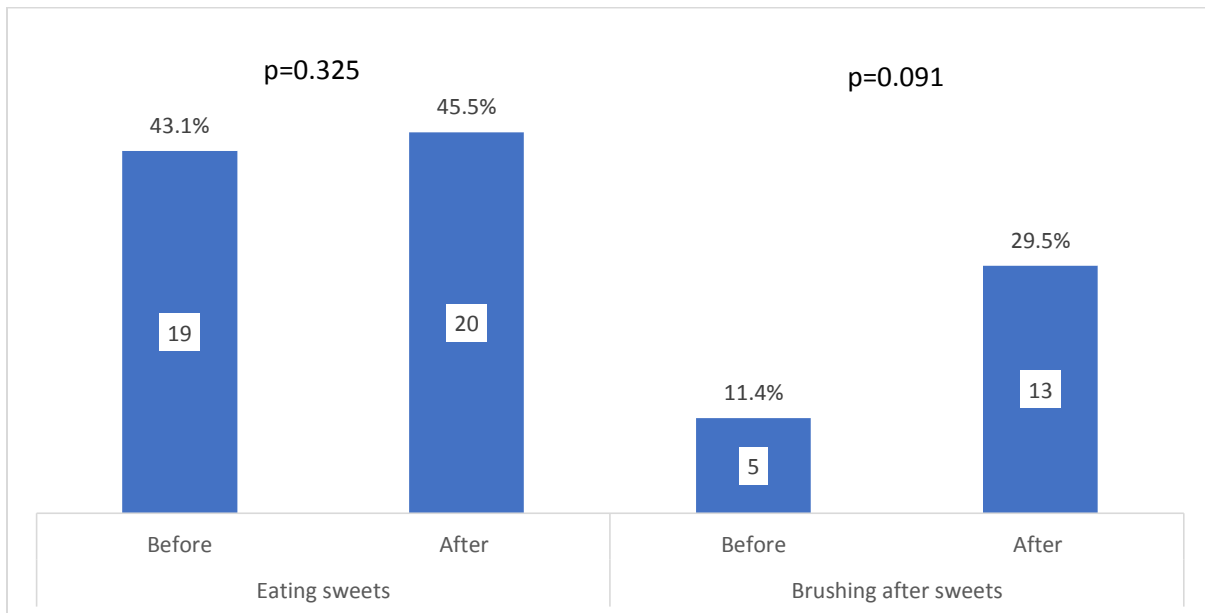
5.1.5.3. (Figure 3): Comparison of oral health indicators by gender

Fully blind children appeared to have higher scores for Debris, Calculus, gingival index and caries but it was not statistically significant (Figure 1). Likewise, children whose parents have less than university Education were showed higher scores in all indicators (Figure 2). Females have lower scores than males in oral hygiene and gingival index. However, females had higher levels of dental caries than males (Figure 3).

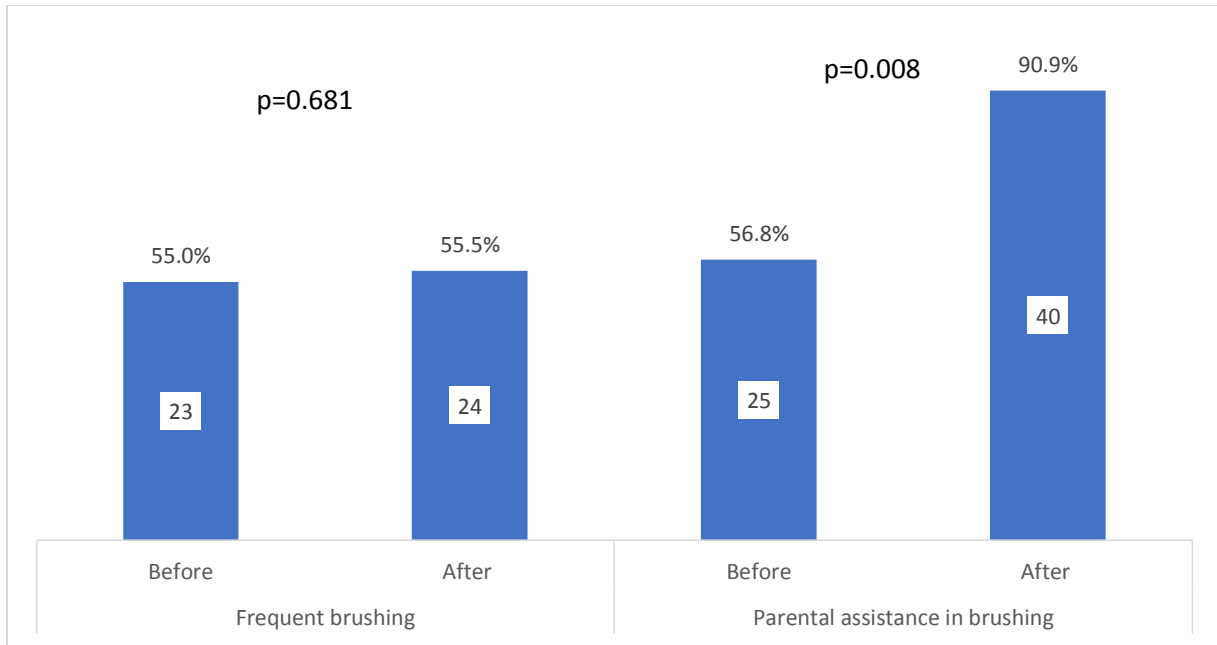
5.2. PHASE 2

5.2.1. EFFECTIVENESS OF THE ORAL HYGIENE INSTRUCTIONS AMONG VISUALLY IMPAIRED CHILDREN

5.2.2. CHANGES IN ORAL HEALTH INDICATORS



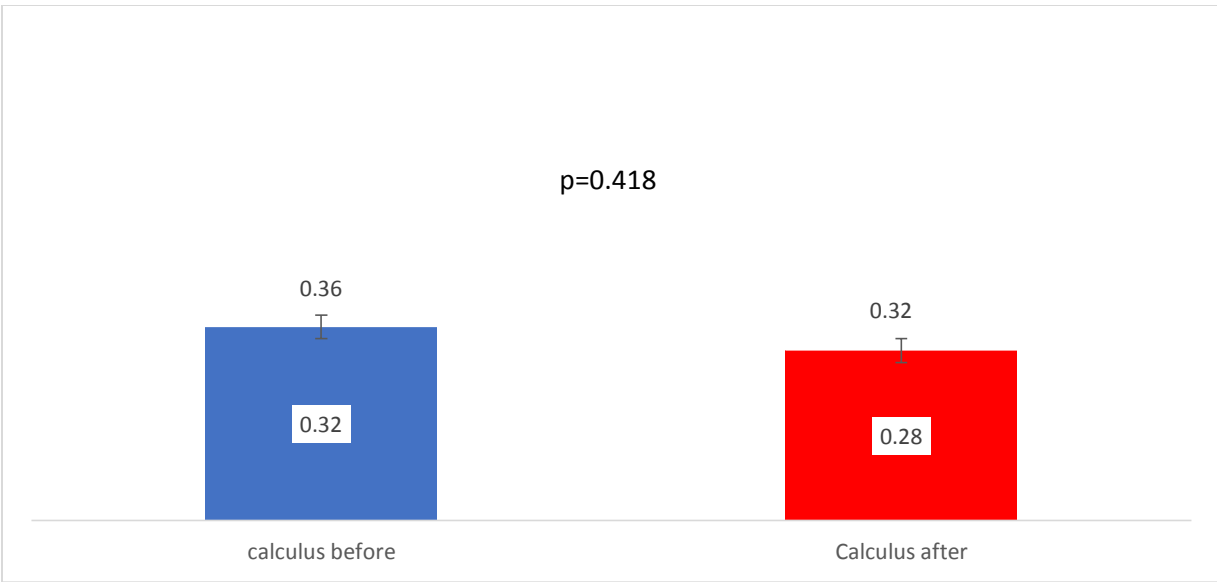
5.2.2.1. (Figure 4): comparison of sugar intake habits



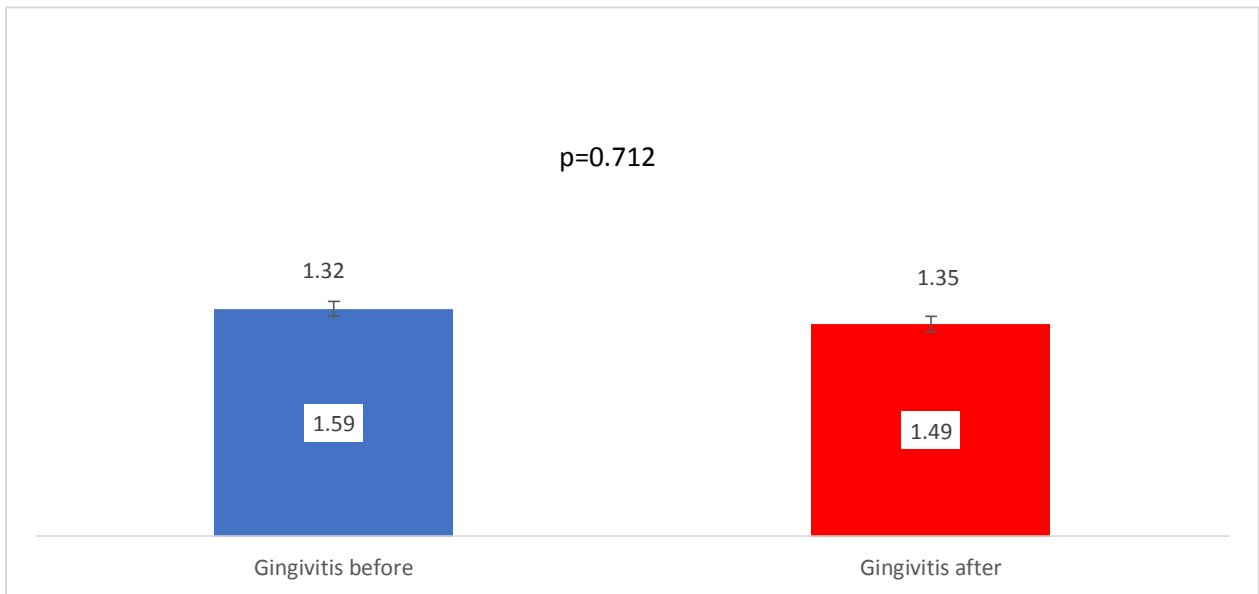
5.2.2.2. (Figure 5): comparison of oral hygiene habits



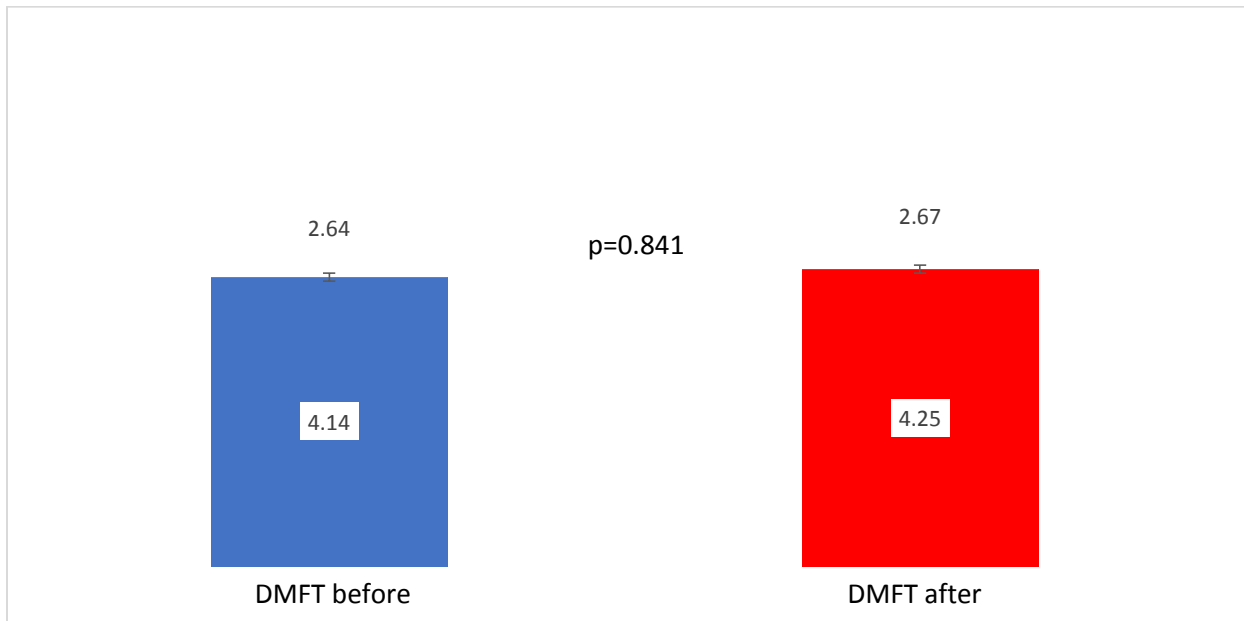
5.2.2.3. (Figure 6): Average score for debris index before and after oral hygiene instructions



5.2.2.4. (Figure 7): Average score for calculus index before and after oral hygiene instructions



5.2.2.5. (Figure 8): Average score for gingival index before and after oral hygiene instructions



5.2.2.6. (Figure 9): Average score for caries level according to DMFT, dmft index before and after the oral hygiene instructions

Figure 4 and 5 depicts changes in oral health behaviours following oral hygiene instructions. Almost similar proportion of respondents indicated eating sweets regularly but the brushing after eating sweets has increased markedly from 11% to nearly 30%. Likewise, the habit of tooth brushing did not show significant differences and remained nearly static. However, the number of parents who assisted their children in toothbrushing significantly increased from 57% to 91% ($p=0.008$).

Figure 6 and 7 describes the changes in the average scores for debris index and calculus index. Before the intervention, the average debris index and calculus index scores were (1.14 ± 0.54 & 0.32 ± 0.36 , respectively). Following the provision of oral hygiene instruction, these figures were marginally decreased to (1.06 ± 0.56 & 0.28 ± 0.32 , respectively). These differences were not statistically significant.

Figure 8 shows comparison of average gingival index score before and after the intervention. It is clear that there is a marginal decrease in the average score following the provision of oral hygiene instruction (1.49 ± 1.32), compared to (1.59 ± 1.35) before the intervention. This difference was not statistically significant. Figure 9 shows comparison of DMFT scores before and after the intervention. It shows that there is marginal increase in the average score from 2.64 to 2.67 for DMFT. The dmft scored from 5.14 to 4.8, both are not statistically significant.

CHAPTER FOUR

6. DISCUSSION

This study looked at the difference in the oral health status of visually impaired and sighted children and the oral hygiene knowledge of their parents or caregivers, ages 6 to 15, who live in Benghazi, Libya. Approximately 60% of the blind kids' families are considered small but still the parent's supervision was very low in comparison to the healthy kids whose large percentage of them live in a big family. This could be explained by the lack of knowledge of these parents about proper ways to deal with the oral health of a blind kid. Moreover, it could be because of psychological trauma in them toward their kid's disability. Psychological treatment should be provided to those who require it.

The American Academy of Pediatrics (AAPD) recommends that parents assist their children with brushing their teeth by distributing the proper amount of toothpaste and demonstrating the proper technique⁶⁵.

Successful oral hygiene programs for visually impaired individuals need the development of changes and routines that enable them to be completely self-sufficient in oral hygiene care and build satisfaction in their accomplishments. This involves obtaining oral hygiene supplies, labeling or storing them appropriately to prevent loss, efficiently brushing all regions, and analyzing if they have been working satisfactorily. There is a need to involve parents and caregivers to insure the best result for these kids. It is good to know that about 77% of this study visually impaired students are able to buy toothbrushes and dental supplies but the main problem was that only 55% are brushing regularly.

As it is well known that to prevent dental caries, early time topical fluoride treatment and pit and fissure sealants are advised as important helpers for these children. Fluoride dentifrices and rinses should be recommended on an individual basis. All these preventive procedures have been demonstrated to successfully minimize dental caries and gingival problem and should be administered whenever appropriate. In the present study, the application of fluoride in both groups has no significant difference, but both of them did not have any information and did not apply fluoride at all. This could explain the high percentage of dental carries in both groups.

Both groups had a non-significant difference in all the outcomes before the intervention. Although the blind kids in comparison with the sighted students had significantly less parent supervision during brushing and the majority did not brush after eating sweets. This could be due to lack of knowledge with the proper way to brush teeth and the high percentage of absence of dental flossing in this study data, in both groups' subjects. There should be a training program to teachers in the school system to provide accurate ways to brush and floss teeth to their students.

Although this study did not research the diet quality in this population, however, diet counseling should be provided to emphasize the need of a balanced diet because of the strong relationship between sugar consumption and dental caries. Dental problems in these kids could be due to Caregivers of children with developmental disabilities may not be aware of how restricting sugar exposure might help prevent dental caries and periodontal disease⁶⁵.

The expectation in this study was that visually impaired students will have worse oral health at baseline than sighted kids. It was a surprise that the results showed that both groups had similar results! This means that both kids with and without a disability and their parents in Benghazi are in need for a proper frequent

volunteer program provided by the dental institution to improve their knowledge about ways to maintain proper oral health. This was confirmed by a study performed in 2017 in Benghazi on healthy kids attending children department at the faculty of dentistry. The study showed that 93% of youngsters had untreated carious teeth, compared to just 7% of those who arrived with caries-free teeth. Eighty-two percent of the Libyan children included in that study did not brush their teeth at home, whereas five percent brushed only once daily, eleven percent brushed twice daily, and two percent brushed three times daily⁶⁶.

Previous studies reported that visual impaired kids are more likely to suffer from tooth decay. Dental problem is also more likely to occur in children who do not receive adequate parental supervision, as well as those who are less concerned about their looks. These youngsters have poor dental hygiene, gingivitis, and periodontal disease^{51,53}.

In 2013, a similar study was conducted in Benghazi, Libya. The study evaluated the prevalence of dental trauma and DMFT in both sighted and unsighted kids. That study confirmed the result of the current study. The differences between the two studies are: First, the current study has higher sample size for both blind and healthy kids. Second, the current study used a survey and performed an Eleven month follow up after educating all subjects. Finally, the current study involved children from age 6-15 years old (previous study included adolescents aged 10-14 years old⁶⁷).

6.1. Study Limitations

After the oral health education intervention, the results showed minor improvement in calculus index, gingival index and plaque index in the visually impaired kids. Although, the changes are statistically non-significant but it shows that a change is happening. A follow up after 11 months was not enough to show a statistically significant result. In addition, the current study result cannot be generalized as the study participants did not represent the visually impaired children in Libya. For the reason that all participants were exclusively from Benghazi.

6.2. Study Strength

This study strength was that all visually impaired children registered in blind children association were included in this research with no loss of follow up or drop offs. This sample represent all school aged visually impaired kids in Benghazi Libya. In addition, a visually impaired children: sighted children ratio of 1:2 with matching gender and age was implemented in this study to reduce the confounding.

Another strength was that the oral examination was performed by the same investigator in both before and after the intervention. This minimized the possibility for differences in the measurements. The investigator bias was reduced by providing an at home anonymous survey to the parents. This help maintaining the accuracy of the information received from them.

CHAPTER FIVE

7. CONCLUSION

Visually impaired children have poor plaque control, gingivitis, and high dental caries level, as well as difficulty obtaining health care professionals. In order to reduce plaque and avoid caries, they require substantial oral health education programs. Physical, social, or informational barriers associated to the visual impairment or accompanying medical problems, as well as, a lack of information in an appropriate format may affect oral health. Furthermore, there is a shortage of transportation and services, insufficient resources or economic difficulties, lack of social awareness, and education all these factors have a great impact on the oral health of both visually impaired and sighted children in Benghazi.

Improving children's oral health condition in Benghazi, Libya is a big task. Therefore, it is important to provide oral health promotion programs and periodical volunteer dental visits that targets this population and their parents/caregivers. However, further study is necessary to determine the kind of health promotion programs, as well as, the frequency and type of visits needed that might be beneficial to blinded kids and their parents and caregivers.

It's important for dentists to keep an eye on the oral health of visually impaired youngsters at least four times a year, despite the lack of research on this topic. Teachers and parents should be encouraged to learn about proper oral hygiene and brushing techniques for youngsters. Children with visual impairments may benefit from better dental hygiene, which can prevent difficulties and improve their quality of life. Drinking fluoridated water, eating dairy products rich in calcium and phosphates, such as cheese, and sucking on sugar-free gum may all be beneficial for these youngsters. More research is needed to improve the dental

health of children with visual impairments, whose numbers are on the rise all around the world. For example, more studies should be performed to find out the correct way to educate visually impaired children and their families about the importance of the oral health. A recommendation for future studies to perform this same research with at least two years follow up and frequent oral health education intervention in regular bases, could show significant changes in the dental and oral health outcome in this population.

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9. APPENDIX 1

9.1. STATEMENT OF PARENTS INFORMED CONSENT

You are being asked to participate as a volunteer in a research study conducted by Dr. Rania Bu khazam, as a part of the master's degree thesis requirements. This study is designed to gather information to assess the level of oral health knowledge of parents of a child with visual impairment at the Association blind Benghazi school. As well as, to perform a general oral examination to your child by the doctor mentioned above to evaluate the presence of caries, plaque, dental calculus and gingival status.

As a parent, you and your child will be one of approximately 44 parents and kids participating in this study by completing this questionnaire and allowing your kid to have an oral examination. Please note that:

1. Your participation in this project is voluntary. You may withdraw from the study at any time without penalty or harm of any type.
2. Completing the questionnaire will require approximately 10-15 minutes. There are no known risks associated with completing the questionnaire. If, however, you feel uncomfortable in any way during this process, you may decline to answer any question, or not complete the questionnaire.
3. The researcher will not identify you or your child by name in any report using information obtained from your questionnaire; your confidentiality as participants in this study will remain secure. Subsequent uses of data generated by this questionnaire and oral examination will protect the anonymity of all individuals.
4. This research effort and this questionnaire have been reviewed and approved by Benghazi University.

By completing and submitting this questionnaire, you are indicating that you understand the statements above, and consent to participate in this study (both you as a parent and your child with visual impairment). Do not put your name on the questionnaire; your signature acknowledging that you understand the information presented above is not required.

10. APPINDEX 2

A. Information about both yourself (as a parent or guardian responsible about this kid) and about this child who is involved in this research study (please, make a circle around the answer that you pick)

- You are the:

Mother

Father

Grandparent

Legal guardian

- How old are you?

Less than 30 years old

older than 30 years old

- Your level of education

Never attended school

Elementary school

Finished up to middle school

High school

Collage

University

Postgraduate

- Your occupation

(Please, write it here)

- Where do you and your child live in Benghazi

(Please write here)

- What gender is your child that is involved in this research study

Male

Female

- How old is your child?

Less than 10 years old

More than 10 years old

- How many older brothers and sisters does your child have?

Write the number here

- How many younger brothers and sisters does your child have?

Write the number here

- Does your child follow directions?

YES

NO

- Have you or your child ever received any advice on the care of your child's teeth?

No, neither have received advice

Yes, parent has received advice

Yes, child has received advice

Yes, both parent and child have received advice

- If you received an advice, what was the source of this advice?

Dentist

TV

Book/ newspaper

My child's school

Other (write your answer please)

- Do you think dental health is important?

YES

NO

B. information about your child teeth brushing behavior

- How many times a day does your child brush his/her teeth?

Never

Once a day

Twice a day

After each meal

Sometimes he/she brushes

- Do you assist or help your child to brush his/her teeth?

No, he/she brushes his/her teeth by her/him self

Yes, I brush his/ her teeth by myself

I just supervise him/her when he/she brushes

- What kind of toothbrush does your child use?

Soft

Medium

Hard

I do not know

He/she does not have a toothbrush

- Does your child share his/her toothbrush with other family members?

YES

NO

- Does your child floss his/her teeth?

Yes

NO

- Does your child use mouth wash?

Yes

NO

- Do you as a parent or guardian know about teeth flossing?

YES

NO

C. Information about your child dental health and sugar consumption

- Has your child ever been to the dentist?

YES

NO

- Has your child ever been treated for dental caries?

YES

NO

- Has your child visit the dentist for extraction?

YES

NO

- Has your child visit the dentist for filling teeth?

YES

NO

- Are you able financially to take your child to the dentist if needed?

YES

NO

- Are you able financially to maintain the presence of toothbrush, tooth paste and floss for the use of your child?

YES

NO

- Does your child's mouth have bad odor?

YES

NO

- How many times per week does he/she eats sweets such as candies, chocolates, Libyan sweets?

Never ate sweets

Once a week

Twice a week

Daily

Occasionally

- Does your child brush his/her teeth after eating sweets?

YES

NO

END OF THE SURVEY

THANK YOU VERY MUCH FOR PARTICIPATING

الإستبيان

معلومات بخصوص أولياء الأمور أو أحد أقارب الطفل وعن الطفل الذي شارك في هذه الدراسة البحثية من فضلك علامة (✓) أمام الاجابة التي تراها صحيحة:

1) صلة القرابة

أم الأب الجد قريب

2) كم عمرك

أقل من 30 سنة أكبر من 30 سنة

3) مستواك التعليمي

لم يذهب الي المدرسة مدرسة ابتدائية
انتهي حتي المدرسة المتوسطة المدرسة الثانوية
 جامعة دراسات عليا

4) مهنتك

.....

5) عنوان السكن في بنغازي

.....

6) ما هو نوع جنس طفلك الذي يشارك في هذه الدراسة البحثية

الذكر انثي

7) كم عمر طفلك ؟

أقل من 10 سنوات اكثر من 10 سنوات

8) كم عدد الإخوة والأخوات الاكبر منه سنا

.....

9) كم عدد الإخوة والأخوات الأصغر سنا لدي طفلك ؟

.....

10 فصيلة دم الطفل

O AB B A

.....

11 هل يعاني من أي مشكلة صحية

.....

12 ما هي نوع المشكلة البصرية لدي طفلك؟

فقدان بصر جزئي فقدان بصر كلي
ضعف نظر شديد

إذا كان ضعف النظر شديد ما مدي الرؤية لديه

.....

13 هل المشكلة منذ الولادة أو بعد الولادة

منذ الولادة بعد الولادة
إذا كانت اجابتك بعد الولادة ما هو السبب ؟

.....

14 هل هناك فرد من الأسرة لديه نفس المشكلة البصرية ؟

نعم لا
إذا كانت الاجابة بنعم ما هي صلة القرابة

.....

15 هل يتبع طفلك توجيهاتك ؟

نعم لا

16 هل تلقيت أنت أو طفلك أي مشورة بشأن رعاية أسنان طفلك ؟

لا , لم نتلقى أي نصيحة نعم , تلقي الوالد النصيحة
نعم , تلقي الطفل النصيحة نعم , تلقي كل من الوالدين والطفل المشورة

17 إذا تلقيت نصيحة فما هو مصدر هذه النصيحة؟

دكتور الاسنان تلفزيون وسائل التواصل مدرسة طفلك اجابه اخرى تذكر.....

18) هل تعتقد أن صحة الاسنان مهمة ؟

نعم لا

معلومات حول العناية اليومية بالأسنان من قبل طفلك

19) كم مرة في اليوم يقوم طفلك بتنظيف أسنانه؟

لا يستعمل مرة وحدة في اليوم مرتين في اليوم
بعد كل وجبة في بعض الأحيان

20) هل تساعد طفلك على تنظيف أسنانه ؟

يفرش اسنانه بنفسه نعم, انا انظف أسنانه بنفسي
انا فقط اشرف عليه

21) نوع فرشاة الأسنان التي يستخدمها طفلك ؟

ناعم متوسط خشنة لا اعرف
لا يملك فرشاة أسنان

22) هل يشارك طفلك فرشاة أسنانه مع افراد الأسرة الاخرين؟

نعم لا

23) هل طفلك يستعمل خيط الأسنان

نعم لا

24) لديك دراية بالخيط الطبي للأسنان ؟

نعم لا

25) هل طفلك يستعمل غسول الفم؟

نعم لا

26) ما هو نوع الغسول

معلومات عن صحة أسنان طفلك ومعدل أكل السكريات

27) سبق لطفلك الذهاب الي طبيب الأسنان

نعم لا

(28) هل سبق لك وأن قمت بزيارة طفلك الي طبيب في عيادة ؟

خاصة عامة

(29) هل سبق أن تلقي طفل حشو للأسنان

نعم لا

(30) هل سبق أن تلقي طفلك خلع للأسنان

نعم لا

(31) هل سبق لطفلك أن تلقي جلسات فلوريد؟

نعم لا

(32) هل انت قادر ماليا على اصطحاب كفلك الي طبيب الأسنان اذا لزم الأمر ؟

نعم لا

(33) أنت قادر ماليا على توفير فرشاة الأسنان ومعجون الأسنان والخيط الطبي للأسنان ؟

نعم لا

(34) هل لدي فم طفلك رائحة كريهة ؟

نعم لا

(35) كم مرة في الأسبوع طفلك يأكل الحلوي كالكشكولاتة والحلوي أو الحلويات بأنواعها

أبدأً لا يأكل الحلوي مرة في الأسبوع

مرتني في الأسبوع يومي

من حين اخر

(36) هل ينظف طفلك أسنانه بعد تناول الحلويات ؟

نعم لا

نهاية الاستبيان

وشكرا جزيلا على مشاركتكم

صحة الفم للأطفال ذوي الإعاقة البصرية في مدينة بنغازي، ليبيا

اعداد

رانيا محمد بوخزام

المشرف

د فوزية مفتاح علي

الملخص

الأطفال المعوقين بصرياً هم الأطفال الذين يحتاجون الي رعاية خاصة واهتمام بسبب مشكلتهم البصرية التي تتسبب لهم قصوراً في بعض المهام منها كيفية العناية الجيدة بتنظيف الأسنان والذي في حالة عدم الاهتمام ينتج عنها تراكم البلاك علي الاسنان والالتهابات اللثوية وتسوس الأسنان لذي تحتاج هذه الفئة من المجتمع الي برامج للتنظيف الصحى وكذلك تشجيع أولياء الأمور والمعلمين علي تعليمهم كيفية العناية الجيدة بصحة الفم لهؤلاء الاطفال وتحسين نوعية حياتهم.

الكلمات الرئيسية: الإعاقة البصرية ، العمى، صحة الفم ، نظافة الفم ، تسوس الأسنان ، البلاك ، التهاب اللثة.

المواد وطرق البحث: دراسة مقطعية شملت عدد 44 من الأطفال ذوي الإعاقة البصرية و 102 من الطلاب الذين لا يعانون اي مشاكل بصرية وتتراوح أعمارهم بين 6 و15 عاماً. أجريت الدراسة في فترتين منفصلتين بمدة تتراوح 11 شهراً. وفي كلتا المرحلتين، تم إعطاء الوالدان الإستبيان ، وتم إجراء فحص لصحة الفم عن طريق تقييم مستوى البلاك وتسوس الأسنان و صحة اللثة والترسبات الجيرية لكل طالب مسجلاً في الدراسة قبل وبعد إعطائهم الإرشادات الصحية المتعلقة بصحة الفم والاسنان.

النتائج : أظهرت النتائج أن الأطفال ذوي الإعاقات البصرية لديهم نسبة أعلى من الأسنان المتسوسة بالمقارنة مع الأطفال الذين لا يعانون إعاقات بصرية، على الرغم من أنها لم تكن ذات دلالة إحصائية وبالإضافة إلى أن مستوى البلاك و التهابات اللثة أيضاً كان المعدل مرتفعاً عند الأطفال ذوي الإعاقات البصرية ولكن معدل الترسبات الجيرية كان أعلى لدى الأطفال الأصحاء بالمقارنة مع الأطفال ذوي الإعاقات البصرية. ولوحظ أن مقارنة معدل التهابات اللثة قد أوضح انخفاضاً نسبياً بعد التعليمات التي أعطيت لهم من أجل المحافظة والاهتمام بنظافة الفم والأسنان.

يعتمدان الفئتان الآخرتان الرؤية من خلال المعينات البصرية المختلفة. ومن أسباب الإعاقات البصرية العوامل الوراثية أو العوامل المكتسبية (نتيجة بعض الأمراض ونقص الفيتامينات و زيادة نسبة الأوكسجين في الحضانه التي تصيب العين أو الأصابات الناتجة عن الحوادث). وقد أفادت معظم الدراسات إن الأطفال الذين يعانون من إعاقات بصرية لديهم مشاكل في صحة الفم والاسنان وقد يعزى ذلك إلى عدة عوامل تشمل عدم المقدرة الجيدة علي نظافة الفم وإزالة البلاك بفعالية وذلك لوجود بعض التحديات التي تواجههم ومنها: صعوبة التحكم عن طريق اليدين والعينين وعدم كفاية الإشراف من قبل الوالدين أو الشخص الذي يتولى رعاية الطفل كذلك افتقاره إلى المهارات اليدوية اللازمة لتنظيف الأسنان بشكل جيد. لذلك يعتبر الحفاظ على صحة الفم والاسنان تحدياً في هذه الفئة من المجتمع ولهذا الوعي الصحي مطلوب من أجلهم عن طريق إعطائهم الإرشادات الصحية اللازمه بالطريقة التي تتماشى معهم.

الهدف: كان الهدف من الدراسة هو تقييم الحالة الصحية للفم لدى الأطفال ذوي الإعاقات البصرية والأطفال الذين لا يعانون من مشاكل بصرية كذلك المعرفة للوالدين أو الشخص المتولي رعاية الطفل ذوي الإعاقات البصرية والمبصرين في مدينة بنغازي قبل وبعد إعطائهم الإرشادات المتعلقة بصحة الفم والاسنان.



صحة الفم للأطفال ذوي الإعاقة البصرية في

مدينة بنغازي - ليبيا

قدمت من قبل

رانيا محمد بوخزام

تحت اشراف

د . فوزية مفتاح علي

قمت هذه الرسالة استكمالاً لمتطلبات الحصول علي درجة الماجستير في

في طب اسنان اطفال

جامعة بنغازي

كلية الطب وجراحة الفم والاسنان

فبراير 2021