

Master of Science in Public Health



ASSESSMENT OF ORAL HEALTH-RELATED  
QUALITY OF LIFE AMONG VISUALLY  
IMPAIRED CHILDREN VISITING A TERTIARY  
EYE HOSPITAL IN RAWALPINDI CITY

By

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**Islamabad, Pakistan**

(2023)

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**(362848-PIO/MSPH-2021)**

Dissertation submitted in partial fulfilment of the requirement for the  
degree of:

**MASTER OF SCIENCE IN PUBLIC HEALTH(2022)**

to

**Al-Shifa School of Public Health, PIO, Al Shifa Trust Eye Hospital,  
Faculty of Medicine  
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Islamabad.**

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## **Declaration**

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I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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## ABSTRACT

### **Background:**

There have been very few quality-of-life studies done on Oral health related Quality of life in developing countries like Pakistan and even less so in Rawalpindi, Punjab. The aim of current study was to determine the OHRQoL among visually impaired children and to determine its association with the some of the socio-demographic characteristic in a tertiary eye care hospital, Rawalpindi to improve the OHRQoL of such patients.

### **Methodology:**

It was a cross sectional study done for a period of six months at a tertiary eye care hospital in Rawalpindi using a sample size of 384. Data collection was done after informed consent. Structured questionnaires using C-OIDP and clinical examination were done by trained persons, demographic data was collected in section A of the questionnaire. SPSS v26 was used for data cleaning and data analysis.

### **Results:**

Out of 384 participants, 280(72.9%) had reported with dental caries with a mean DMFT of 1.64 and mean deft of 1.53. Results showed that 266(69.2%) visually impaired children had traumatic dental injuries was 50.6% among these visually impaired children. The study sample showed the highest scores of Angle's Class I molar relation 188(49%). Crowding (42.7%) was most commonly seen dentofacial anomaly in the study group The OHRQoL of life was reduced across all domains. Oral health related Quality of life was reduced and a significant association was found between demographic characteristics and OHRQoL.

**Conclusion:**

There was a high prevalence of dental diseases in this group and higher C-OIDP scores suggestive of unfavorable OHRQoL. Along with everyday movements and activities such patients also face social challenges because of their disease. Therefore, routine Dental checkups of Visually Impaired Children and timely referral to dentist is essential and can improve their outcome as well as their Oral health related quality of life.

**Keywords:**

OHRQoL, C-OOIDP, Visual Impairment.

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## LIST OF ABBREVIATIONS

ASOPH	Al Shifa School of Public Health
HEC	Higher Education Commission
QOL	Quality of Life
OHRQoL	Oral Health related quality of life
C-OIDP	Child Oral Impact on Daily Performance
TDI	Traumatic Dental Injuries
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

## CHAPTER I: INTRODUCTION

The oral-facial region is conventionally an area of consequential concern for the individual because it draws the most attention from other people in interpersonal interactions and is the primary source of vocal, physical, and emotional communication thus Oral health has a great impact on our overall health including both physical and psychological. Visually impaired children are among those with special needs. Visual impairment, also known as vision impairment, is a medical definition primarily measured based on an individual's better eye visual acuity; in the absence of treatment such as correctable eyewear, assistive devices, and medical treatment– visual impairment may cause the individual difficulties with normal daily tasks including reading and walking (*Vision Impairment and Blindness | Examination-Based Studies | Information on Data Sources | Vision and Eye Health Surveillance System | Vision Health Initiative (VHI) | CDC, 2021*)

Visual impairment is divided into complete blindness and low vision (Pascolini & Mariotti, 2012). Visually impaired children have poorer oral health than those with normal vision. According to previous research visually impaired children had generally poor oral hygiene, with a sufficiently high prevalence of caries (Prashanth et al., 2011) (Parkar et al., 2014) (Solanki et al., 2013). (Shewale et al., 2017) reported that visually impaired children could not visualize plaques on tooth surfaces, which result in poor oral hygiene maintenance and increased caries. (Shetty et al., 2010) suggested that this may be related to visually impaired children's decreased capacity to maintain oral hygiene as a result of a lack of motor-visual coordination. Without the supervision of their parents, most of these children brush their teeth only once a day. Another contributing factor may be these children's lack of concern for their physical appearance.

Owing to their poor vision, visually impaired children also have a poor sense of orientation, which affects their ability to determine directions and locomotor abilities, resulting in a high prevalence of dental trauma and increased risk of general trauma, (Reddy & Sharma, 2011) (Bhat et al., 2011) which in turn results from the decreasing orientation related to directions and their abilities. Children's diverse oral health problems are directly related to annoyance and tooth pain, which ultimately affect children's and their parents' and families' QoL (Debnath et al., 2017) (Akhter et al., 2019).

Oral health-related quality of life (OHRQoL) showed individual differences in terms of how each individual deals with their physical, psychological, and social functions in their daily lives, which affects their dental health statuses (Papaioannou et al., 2011). The study showed that oral health condition was frequently related to socio-economic status, which may influence OHRQoL (Kumar et al., 2014). The families of children with disabilities frequently have higher living costs for health treatment. They also experience other problems such as reduced working hours or quitting a job to take care of their family members with disabilities. Nursing care for children with disabilities, such as visually impaired children, requires three times higher cost than that for healthy children (Desriyanietal.,2019).

Previous research has established links among socio-economic level, oral health outcomes, and OHRQoL (Piovesan et al., 2011) (Paula et al., 2012). The existing disparities in socioeconomic status have a detrimental effect on OHRQoL (Bof de Andrade & Drumond Andrade, 2019). Research on the OHRQoL of healthy children has advanced significantly, whereas that in children

with specific needs, such as visually impaired children, remains severely constrained. (Tagelsir et al., 2013) and (Singh et al., 2017) conducted separate studies on visually impaired children using the Child-Oral Impact on Daily Performance questionnaire as their research instrument. Tagelsir *et al.* reported that the OHRQoL of visually impaired children had no significant relationship with their oral health statuses in terms of, for example, caries experience, Oral Hygiene Index-Simplified (OHI-S) score, and dental trauma. Singh *et al.* reported contradicting findings, claiming that strong relationships exist between caries exposure and dental trauma and the oral cavity health of visually impaired children. Those discrepancies in findings undoubtedly necessitate more investigations in comparable research subjects. The purpose of this study was to determine whether oral health outcomes are associated with parental socio-economic level and OHRQoL in visually impaired children.

Clinical indicators of oral diseases were not entirely suitable to capture the new concept of health declared by the WHO (Garg et al., 2012). Hence, researchers started to develop alternative measures that came in the form of standardized questionnaires (Rozier & Pahel, 2008)

Oral health-related quality of life (OHRQoL) is a relatively new but rapidly growing phenomenon which has emerged over the past two decades (Garg et al., 2012). Although C-OIDP assessment has recently penetrated into the pediatric dental literature, assessment of C-OIDP in special populations such as visually impaired children has been hindered by several factors mostly lack of awareness about the same. Thus, an effort was made to appraise the impact of oral diseases on daily activities of these visually impaired children in our study by evaluating the existing oral health status of 9–15-year children with visual impairment in district of Rawalpindi, Pakistan, with

regard to dental caries experience, dental trauma, and dentofacial anomalies and assessing the impact of the oral health status if any, on quality of life of these children using C-OIDP Index.

### **RATIONALE OF THE STUDY:**

- In Pakistan a lot of different studies have been done on prevalence, incidence of visually impaired children but very little work has been done on the oral health quality of life of these patients.
- Our study will help the visually impaired children in maintaining their oral health related quality of life by identifying challenges faced by them and measure the oral health related quality of life and socio-demographic factors associated with the oral health related quality of life of these patients.
- It will also point out the domains in which the oral health related quality of life of these patients is affected and point out the interventions which are needed to be introduced to improve the OHQOL of these patients.
- For example, introducing special oral health care measures tailor-made for this special population can be implemented at the earliest. Furthermore, provision of oral health education in special schools including proper instructions on oral hygiene practices in braille language can be implemented at the earliest. Focus should be changed from the clinical aspects of the diseases to encompass all the socio-cultural and psychological domains enabling the health care providers to manage other mental and physical effects that are caused by the disease.

- The main purpose of our study is to not only measure components of oral health status among visually impaired children through various indices but also to find out the impact of the oral health status if any, on quality of life of these children using C-OIDP index. The perceptions of the shape, color, and alignment of teeth can vary from person to person and can affect people accordingly. Keeping this in mind, the self-reported or patient-reported health outcomes such as OHRQoL will be used in our study.

### ***OPERATIONAL DEFINITIONS:***

#### **OHRQOL:**

Oral health-related quality of life (OHRQoL) is defined by self-reports categorically pertaining to oral health, capturing both the functional, gregarious and psychological impacts of oral disease (Gift & Redford, 1992).

#### **VISUAL IMPAIREMENT:**

Visual impairment, also known as vision impairment, is a medical definition primarily measured based on an individual's better eye visual acuity; in the absence of treatment such as correctable eyewear, assistive devices, and medical treatment– visual impairment may cause the individual difficulties with normal daily tasks including reading and walking (*Vision Impairment and Blindness | Examination-Based Studies | Information on Data Sources | Vision and Eye Health Surveillance System | Vision Health Initiative (VHI) | CDC, 2021*)



***Research Problem:***

The research problem is to investigate the OHRQOL in visually impaired children presenting for their treatment at Al Shifa Children Eye Hospital, Rawalpindi and to find out any socio-demographic factors that influence it, so that more specific intervention can be derived, better preventive measures may be introduced that tackle the socio-cultural and psychological aspects of the disease.

***Objectives of the study:***

The objectives of the current study were:

- To assess the oral health related quality of life among visually impaired children visiting a tertiary eye hospital in Rawalpindi city.
- To assess the frequency of dental diseases among visually impaired and find out its impact on their daily activities.
- To identify the factors affecting Oral health related quality of life.

**Dependent Variables:**

Dependent Variable will be pretested and pre-validated Child Oral Impacts on Daily Performances (C-OIDP ) questionnaire.

**Independent Variables:**

Independent variables will include socio -demographic factors which were age, gender, type of visual impairment of the patients and qualification, occupation and income of the caretaker/parents of the respondents.

## **CHAPTER II: LITERATURE REVIEW**

### **Global Picture:**

Oral Health related Quality of life research has gained importance in the recent years in health and medicine. A number of studies have been done to find out the state of OHRQoL among children, but a few included disabled children specially with visual impairment as a research study population. According to one such study which was held in Sudan Visually impaired schoolchildren had oral health related problems, mainly dental caries. According to their analysis children who had partial visual impairment (PVI) were 6.3 times (adjusted) more likely to be diagnosed with caries compared to children with complete visual impairment (CVI), and children with caries experience were 1.3 times (unadjusted) more likely to report an oral health related impact on quality of life (Tagelsir et al., 2013).

Another study was conducted in Brazil on Factors Associated with the Oral Health-Related Quality of Life in Children with Intellectual Disabilities. Their results showed that the perception of quality of life in individuals with intellectual disabilities is influenced by different factors. This study investigated the factors associated with quality of life related to oral health in children with intellectual disabilities from the perspective of their parents. It was a cross-sectional study which was carried out with Brazilian children from specialized institutions and their respective guardians. Their data collection through medical records, application of instruments and oral clinical examination (n=92). Most children had poor oral hygiene (64.10%) and a high caries experience (59.8%). The mothers' perception of quality of life related to oral health was low, however there was an association of greater perception when they had low education, female child, less brushing frequency and history of breastfeeding ( $p \leq 0.05$ ). Although the perception of quality of life was low, the oral condition found evidences the need to promote oral health

education actions with children with intellectual disabilities and their respective guardian (Nunes et al., 2020)

In one study conducted in special schools in Yogyakarta and Central Java Province, involved 70 visually impaired schoolchildren (aged 7–18 years). The mean DMFT Index and OHI-S scores were  $4.8 \pm 2.743$  and  $1.94 \pm 0.84$ , respectively. Out of 70 respondents, 22.9% had dental trauma. The Spearman correlation test showed no correlations between the mean OHRQoL score and DMFT/dmft score, no correlations between the mean OHRQoL and dental trauma, and no correlations between the mean OHRQoL and socio-economic status ( $P = 0.672$ ,  $P = 0.551$ , and  $P = 0.465$ , respectively). The OHI-S score correlated with the OHRQoL score for the socio-emotional well-being domain ( $P = 0.031$ ,  $r = -0.258$ ). In the visually impaired children in this study, poor oral hygiene resulted in decreased OHRQoL. However, oral hygiene showed no significant relationships with dental trauma and socio-economic level, and caries showed no significant relationships with dental trauma and OHRQoL in these children (*Oral Health-Related Quality of Life of Visually Impaired Children Aged 7–18 Years Oktadewi FD, Soeprihati IT, Hanindriyo L - Sci Dent J, n.d.*)

### **Regional Picture:**

In India, a prospective study conducted comprising of 423 visually impaired children patients revealed that there was a high prevalence of dental diseases in this group and higher C-OIDP scores suggestive of unfavorable OHRQoL the study showed that there was a high dental caries prevalence of 57.7% in visually impaired children. The prevalence of traumatic dental injuries was 50.6%. Crowding (61.5%) was the most commonly seen dentofacial anomaly and

the most commonly perceived oral health problem was toothache. There was less favorable OHRQoL in males as compared to females (*Assessment of Oral Health-Related Quality of Life in 9-15 Year Old Children with Visual Impairment in Uttarakhand, India Singh A, Dhawan P, Gaurav V, Rastogi P, Singh S - Dent Res J, n.d.*)

### **Local Picture:**

In the context of Pakistan a few studies have been done which aim to measure the OHRQoL among differently abled children. One of these studies was done in Karachi, Pakistan to assess the association of dental caries and oral health related quality of life in mentally or physical disabled children studying in schools of Karachi. This study was conducted on 196 disabled children (mental/physical). Their inclusion criteria was children who were of 6-18 years and having a disability . It showed that all the oral health related quality of life related domains had a significant negative impact on the quality of life in mentally and physical disabled children Dental caries was found in 114 (58.2%). “Oral symptoms” score was ( $4.46 \pm 0.85$  vs.  $4.95 \pm 0.79$ ;  $p < 0.001$ ), “functional limitation” ( $4.12 \pm 1.0$  vs.  $4.63 \pm 0.82$ ;  $p < 0.001$ ), “emotional wellbeing” ( $4.40 \pm 0.92$  vs.  $4.97 \pm 0.70$ ;  $p < 0.001$ ) and “parental distress and family function” ( $3.65 \pm 0.97$  vs.  $4.03 \pm 0.96$ ;  $p < 0.001$ ) in children with and without dental caries respectively. All the oral health related quality of life score domains showed statistically significant association between mentally and physical disabled children with and without dental caries. (Jawed et al., 2021)

## CHAPTER III: METHODOLOGY

### ***Study Design:***

Our study design included a descriptive cross-sectional study which was conducted from July 2022 to September 2022 at the Tertiary Eye Care hospital, Rawalpindi.

### ***Study Duration:***

The study took place from August 2022 to December 2022 at the Tertiary Eye Care hospital, Rawalpindi

### ***Study Setting:***

We conducted our study at a tertiary eye care hospital in Rawalpindi.

### ***Sampling Technique:***

Non-Probability Consecutive sampling technique was used.

### ***Study Population and sample size:***

Sample size of 384 was determined, calculated by using open epi software at 95% CI AND 5% MARGIN OF ERROR. Study population included children aged 9 to 15 years with visual impairments who could speak and read Urdu/English and registered at the Tertiary eye care hospital for regular treatment with no associated co-morbidities, and gave informed consent to participate before enrollment were included in the study. Before obtaining informed consent, participants were explained the purpose and duration of the study and assured that refusal to participate would have no impact on their treatment as usual.

### ***Inclusion Criteria***

- All clients of age 9-15 years with visual impairments visiting tertiary eye care hospital in Rawalpindi city.
- Those who consent to participate in the study

### ***Exclusion criteria***

- Uncooperative children.
- Those with severe systemic diseases, mentally challenged or having any disability other than visual impairments.
- And those who did not give us the consent.

### ***Data Collection Procedure:***

Data collection procedure was done by the trained professional (Dentist) in a face-to-face interview and with the required clinical examination at the eye hospital.

### ***Data Collection tool:***

Our Data collection tool was a self administered questionnaire. The questionnaire will be having 3 sections (A,B and C).

- **Section A:** A socio demographic questionnaire was formulated to collect data on the socio-demographic characteristics such as age, gender, type of visual impairment, education status, occupation .It is included in the Appendix which was collected from all patients that participated in the study. Patients/Parents of respondents who were not

willing to sign consent forms or had co morbidities were excluded. All participants included the study were provided the informed consent and completed the COIDP questionnaire facilitated by the trained health-worker in a face-to-face interview and with the required clinical examination at the hospital.

- **Section B:** This section had Child-Oral Impact on Daily Performance (C-OIDP) questionnaire , which included 8 questions using Likert Scale.
- **Section C: Clinical Examination:** Dental caries was recorded using deft for primary and DMFT dentition permanent dentition. Keeping in mind our second objective which was to assess the frequency of dental diseases among visually impaired and find out its impact on their daily activities we designed Section C in our questionnaire in which we not only asked children some questions regarding their present oral condition but also did the clinical examination to find out if respondent had any tooth decay (cavity in teeth), toothache, sensitive teeth, , exfoliating primary teeth, tooth space (due to a nonerupted permanent tooth), fractured permanent tooth, bleeding gum, swollen gum, calculus, oral ulcers, bad breath, deformity of mouth or face, erupting permanent tooth, and missing permanent tooth. We also recorded Traumatic dental injuries which were assessed using traumatic dental injury index, and Dentofacial anomalies which were recorded using Angle's classification of malocclusion. Traumatic dental injuries were assessed using traumatic dental injury index, and Dentofacial anomalies were recorded using Angle's classification of malocclusion

### ***The Child Oral Impacts on Daily Performances (Child-OIDP) Questionnaire:***

OHRQoL was assessed using the Structured self-administered C-OIDP questionnaire. The feasibility and reliability C-OIDP questionnaire in Visually impaired children has been previously established. It consists of 8 questions. Each question was measured by using Likert scale and had four levels; level 1: not at all, level 2: very little, level 3: Pretty much, level 4: Quite a lot. These eight items cover Eating, Speaking, Washing, Illness, Smiling, Toothaches and Socializing. Structed interviews were taken from the target population which is visually impaired children and their attendants at a tertiary eye care hospital in Rawalpindi city for the study. SPSS v26 was used for analysis of raw data and computation of frequency and distribution according to the required objectives in this study. Questionnaire is attached in Appendix C.

### ***Statistical analysis:***

The data were retrieved from pre coded survey pro forma to a computer. The Excel and SPSS version 26.0 software packages were used for data entry and analysis. Categorical data was analyzed using Chi-square test for differences between groups at p value 0.05 at 95% CI was used for statistical significance. Correlations among sociodemographic, clinical variables, and C-OIDP impact were assessed using Pearson's correlation coefficient, and bivariate analysis was applied between the independent variables, i.e., sociodemographic and oral health indicators, and the outcome of C-OIDP to find out the significance. Significance for all statistical tests was predetermined at a probability value of 0.05 or less.

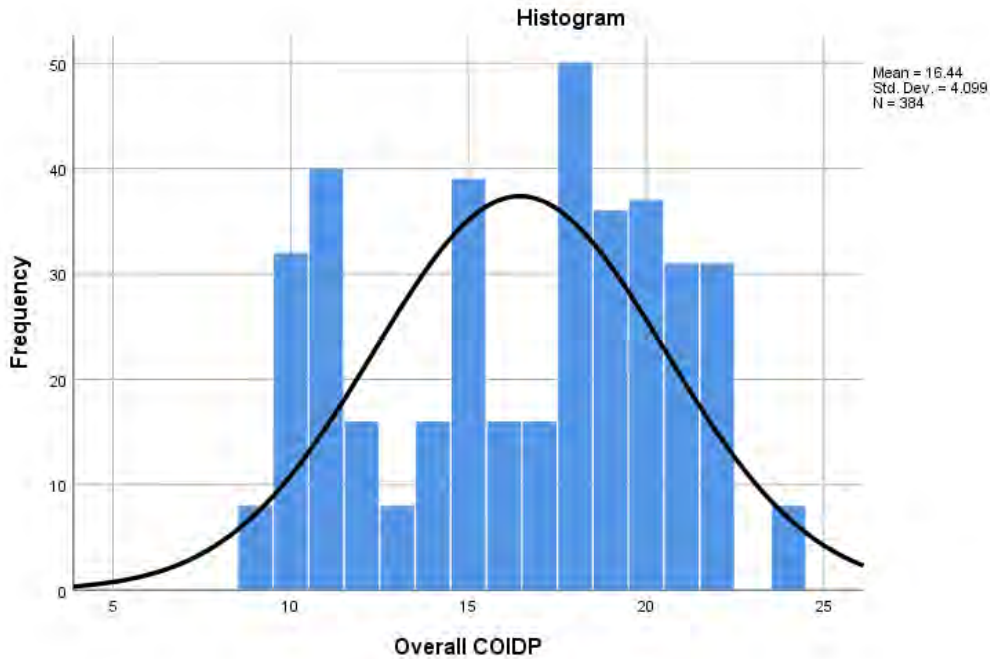


***Ethical considerations:***

Approval for this study was given by the Institutional Review Board (IRB) at Al Shifa School of Public Health, Rawalpindi

## CHAPTER IV: RESULTS

A total of 384 participants were included in this study. Patient aged 9-15 years of both genders were included. After data checking, cleaning and computing the total domain, Reliability and Normality analysis was done. The value of Cronbach's alpha of C-OIDP questionnaire was 0.929.. The Mean age was 11.51 (+/-1.507). There were 266 male which was 69.3% of total population and there were 118 female participants which was 30.7% of population.



**FIGURE 1: GRAPH SHOWING A NORMALLY DISTRIBUTED CURVE.**

This Graph shows a normally distributed curve as Mean score of Overall C-OIDP is 16.44(+/- 4.099), Median=18 and Mode=18. Frequency and percentages of demographic variables are presented in (table 1).

## DESCRIPTIVE ANALYSIS:

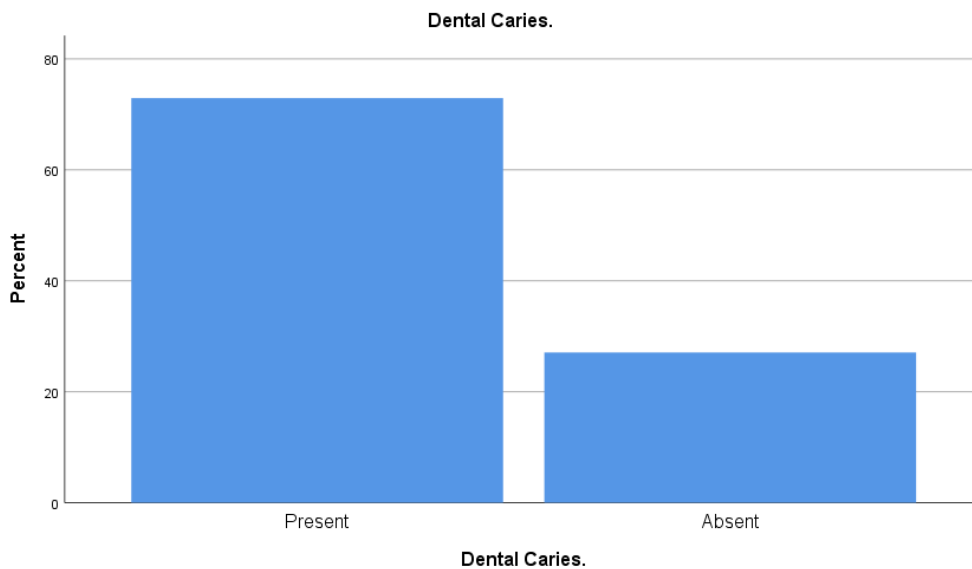
**TABLE 1: DESCRIPTIVE ANALYSIS OF SOCIO DEMOGRAPHIC CHARACTERISTICS (SECTION A)**

VARIABLES	N (%)
<b>Age</b>	
a. Under 12 years	191(49.7%)
b. More than 12 years	193(50.3%)
<b>Gender</b>	
a. Male	266(69.3%)
b. Female	118(30.7%)
<b>Type of visual impairment</b>	
a. Partial visual Impairment	331(86.2%)
b. Complete visual Impairment	53 (13.8%)
<b>Residence</b>	
a. Rural	268(69.8%)
b. Urban	116(30.2%)
<b>Education of the Parents</b>	
a. Illiterate	6(1.6%)
b. Primary	21(5.5%)
c. Matric	64(16.7%)
d. Intermediate	0
e. Bachelors	188(49%)
f. Masters	89 (23.2%)
g. Postgraduation	16(4.2%)
<b>Occupation of Parents</b>	
a. Self-standing business	24(6.3%)
b. Private Employee	94(24.5%)
c. Public Employee	188(49.0%)
d. Retired	0
e. Unemployed	39(10.2%)
f. Housewife	39(10.2%)
<b>Income of the Family</b>	
a. Less than 50,000rs	235(61.2%)
b. More than 50,000rs	149(38.8%)

Out of the 384 participants, 331(86.2%) had partial visual impairment and 53 (3.8%) were diagnosed with complete visual impairment. 268(69.8%) were living in rural areas and 116(30.2%) belonged to urban areas. (Table1)

In terms of educational status, most of the parents of the respondents were educated, 188(49%) were having Bachelor’s Degree and only 6(1.6%) were illiterate, 21(5.5%) had a primary education, 64(16.7%) were having a matric degree, 32 (8.3%), 89 (23.2%) had done masters and 16(4.2%) were done with their postgraduation while none of the respondents had done intermediate.

In the occupation section, 24(6.3%) had a self-standing business,94(24.5%) was private employee,188(49.0%) were public employee, 0 (0%) were retired, 39(10.2%) were unemployed, 39(10.2%) were housewives. (Table 1)



**FIGURE 2: DENTAL CARRIES FREQUENCY (%) AMONG VISUALLY IMPAIRED CHILDREN.**

Our results showed that out of 384 participants, 280(72.9%) had reported with dental caries with a mean DMFT of 1.64 and mean deft of 1.53.

**TABLE 2: PREVALENCE OF DIFFERENT TYPES OF DENTOFACIAL ANOMALIES AND SELF-PERCEIVED ORAL HEALTH PROBLEMS AMONG VISUALLY IMPAIRED CHILDREN.**

Condition	Type	Percentage
<b>Different types of dentofacial anomalies</b>	Anterior open bite	13.3
	Posterior Open bite	2.8
	Anterior Crossbite	2.8
	Posterior Crossbite	4.1
	Deep bite	17.9
	Crowding	42.7
<b>Self-Perceived Oral health problems</b>	Toothache	33.3
	Sensitive tooth	8.1
	Tooth Decay (hole in tooth)	6.0
	Exfoliating Primary tooth	2.1
	Tooth Space due to non erupting permanent tooth	11.7
	Bleeding Gums	14.1
	Swollen gums	4.2
	Calculus	12.2
	Oral Ulcer	2.1
	Bad breath	2.1
	Erupting Permanent Tooth	2.1
	Missing Permanent Tooth	2.1

Out of 384 participants, 280(72.9%) had reported with dental caries with a mean DMFT of 1.64 and mean deft of 1.53. Our study results showed that 266(69.2%) visually impaired children had traumatic dental injuries among these visually impaired children. Most common traumatic dental injuries were enamel fracture 137(35.7%) and subluxation 69(18.0%). While Avulsion 32(8.3%) Extrusive luxation 21(5.5%) and Lateral luxation 7(1.8%) were the least common traumatic dental injuries seen in visually impaired children. Angle's Class I molar relation 188(49%) was reported as the most common malocclusion seen in such patients. Results showed that frequency of Angle's Class II molar relation was 79(20.6%), whereas Angle's Class III molar relation was reported as the least seen type of malocclusion 32(8.3%). Among dentofacial anomalies, Crowding (42.7%) was seen as most common in the study group and posterior open bite and anterior open bite were the least common. [Table 2]. The most commonly perceived oral health problem among visually impaired group was toothache, while on the other hand, Oral Ulcer, Bad breath, Erupting Permanent Tooth and Missing Permanent Tooth as the least perceived oral health problem. Toothache was the most common oral condition affecting almost all the daily activities and had maximum impact on sleeping, studying, and eating.

## DESCRIPTIVE RESULTS (SECTION B):

There was a total of 8 items in the section B (C-OIDP questionnaire).

**TABLE 3: MEAN SCORES FOR DIFFERENT DOMAINS OF C-OIDP QUESTIONNAIRE**

INDICATOR	MEAN	STANDARD DEVIATION (+/-)
Eating	2.0	.000
Speaking	1.75	.434
Washing	1.92	.277
Sleeping	1.75	.434
Illness	1.63	.484
Smiling	1.71	.454
Toothache	1.94	.242
Socializing	1.46	.499
C-OIDP TOTAL	16.44	4.099

The results shows that lowest score for C-OIDP were observed in Socializing (1.46+/- .499), followed by Illness (1.63+/- .484), whereas highest scores were observed in eating (2.00+/- .000). [Table 3]

**TABLE 4: C-OIDP SCORES AND THEIR FREQUENCY OF ANSWERS.**

<b>C-OIDP questions</b>	<b>“Not at all” or “Very Little” N(%)</b>	<b>“Pretty much” or Quite a lot” N(%)</b>
1. Are you having difficulties in eating(biting/chewing)?	0	384(100%)
2. Are you having difficulties with speech or word pronunciation?	32(8.3%)	252(91.7%)
3. Are you having problems washing your mouth due to mouth related issues?	96(25%)	288(75%)
4. Have you had sleepless nights due to toothaches or other mouth related issues?	96(25%)	288(75%)
5. Did you feel ill because of problems inside your mouth?	143(37.2%)	241(62.8%)
6. Do you avoid smiling or showing your teeth because of problems inside your mouth?	111(28.9%)	273(71.1%)
7. Have toothaches or mouth related problems ever prevented you from attending schools?	24(6.3%)	360(93.8%)
8. Have your problems with teeth prevented you from meeting with your friends or from other social activities?	209(54.4%)	175(45.6%)

Our results showed that difficulties in eating(biting/chewing) 384(100%) and toothaches 360(93.8%), were the most common problems faced by visually impaired children. 288(75%) had issues of washing the face and have had sleepless nights. 273(71.1%) avoided smiling and 252(91.7%) had difficulties with speech or word pronunciation.



## ***INTERPRETATION:***

### **DOMAINS OF C-OIDP:**

The results highlighted that lowest score for C-OIDP were observed in Socializing (1.46+/-0.499), followed by Illness (1.63+/-0.484), whereas highest scores were observed in eating (2.00+/-0.000).

Table 3

Our results showed that difficulties in eating(biting/chewing) 384(100%) and toothaches 360(93.8%), were the most common problems faced by visually impaired children. 288(75%) had issues of washing the face and have had sleepless nights. 273(71.1%) avoided smiling and 252(91.7%) had difficulties with speech or word pronunciation. [table 4]

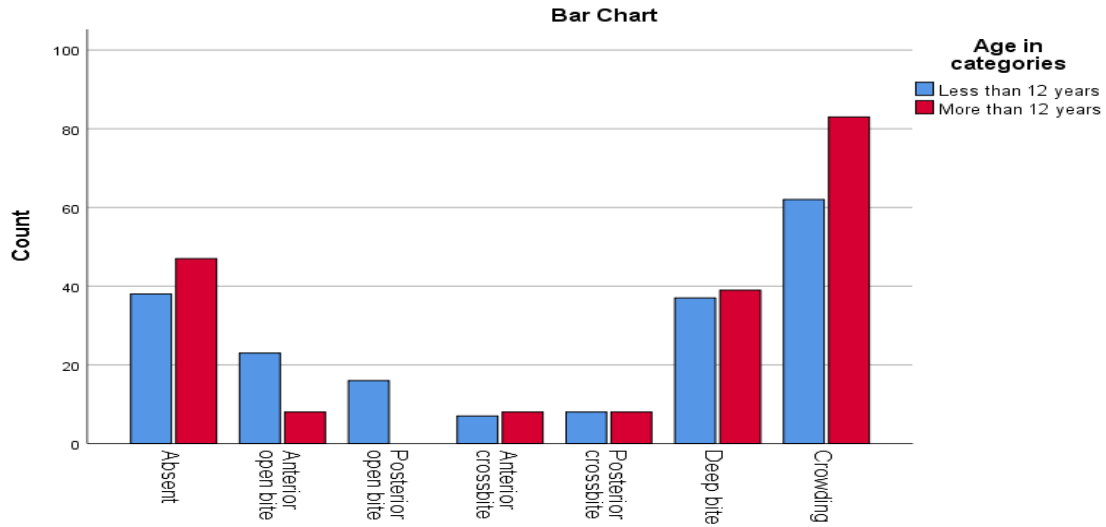


FIGURE 3: BAR CHART COMPARING DENVTOFACIAL ANOMALIES AND AGE.

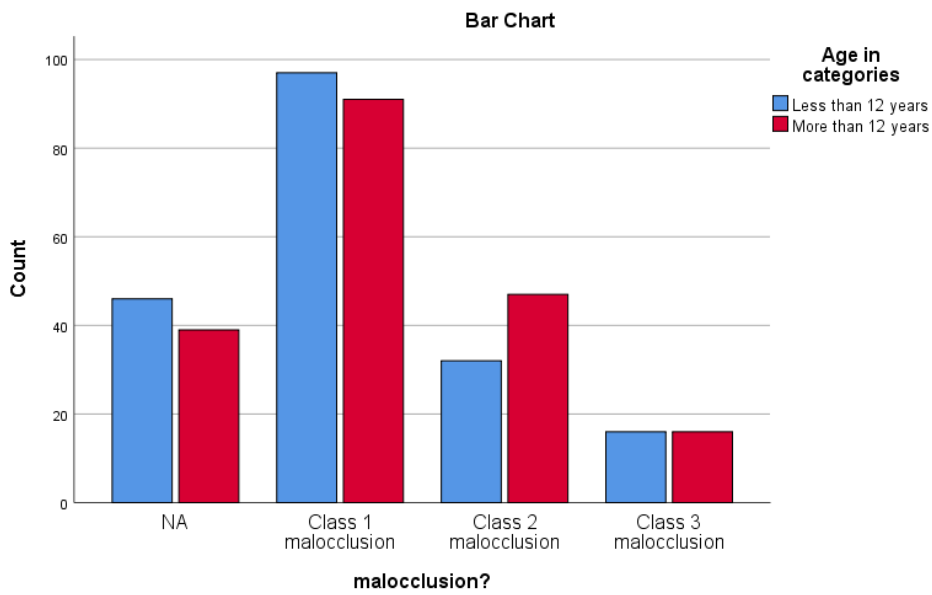


FIGURE 4: BAR CHART SHOWING TYPES OF MALOCCCLUSIONS WITH AGE IN CATEGORIES

**INFERENTIAL RESULTS:**

**TABLE 5: PEARSON’S CORRELATION.**

*Correlations among sociodemographic, clinical variables, and Child-Oral Impact on Daily*

*Performances impact and bivariate analysis between the independent variables:*

*Sociodemographic and oral health indicators, and the outcome Child-Oral Impact on Daily*

*Performances with 95% confidence interval*

Socio-demographic and Clinical variables	C-OIDP impact>0 (95%CI)	Pearson correlation	P
<b>Age</b>	1	-.335**	.000
Under 12			
More than 12 years			
<b>Gender</b>	1	-.575**	.000
Females			
Males			
<b>Type of Visual Impairment</b>	1	-.375**	.000
Partial impairment			
Complete impairment			
<b>Educational status(parents)</b>	1	-.170**	.001
<b>Occupation(parents)</b>	1	-.071**	.162
<b>Caries experience</b>	1	-.329**	.000
Absent			
Present			
<b>Dentofacial Anomalies</b>	1	.039	.443
Absent			
Present			
<b>TDI</b>	1	.150**	.003
No trauma			
Present			
<b>Self-Perceived oral health problems</b>	1	-.138**	.007
**Correlation is significant at 0.01 level(2 tailed)	C-OIDP Child oral impact on daily performance	TDI – Traumatic Dental injury	CI – Confidence Interval

## **ASSOCIATION OF C-OIDP DOMAINS BY DEMOGRAPHIC CHARACTERISTICS:**

The C-OIDP impact showed highly significant positive correlation with age, study group, and significant negative correlation with DMFT [Table 4]. The male participants tended to have higher C-OIDP scores as compared to females thus suggesting less favorable OHRQoL in males as compared to females. Children who presented with dentofacial deformities, dental caries, and traumatic dental injuries reported higher C-OIDP scores suggestive of unfavorable OHRQoL.

Comparison of C-OIDP Questions with different age groups, between males and females, with different educational status and occupation and income of the respondent's family demonstrated a statistically significant result. It indicates strong evidence against the null hypothesis.

Pearson correlation was conducted to check relation between age, dental caries, gender, TDI, Dentofacial anomalies, self-perceived dental problems and Overall C-OIDP Score. The test was run after checking assumptions of normality and linearity.

Our results indicate that the C-OIDP impact showed a weak positive correlation with Dentofacial anomalies (.04) and Traumatic dental injuries (.150) and a weak negative correlation with Age (-.3), moderate negative correlation with Type of visual impairment (-.4) and a strong negative correlation with gender (-.6) [Table 4]. The male participants tended to have higher C-OIDP scores as compared to females thus suggesting less favorable OHRQoL in males as compared to females. Children who presented with dentofacial deformities, dental caries, and traumatic dental injuries reported higher C-OIDP scores suggestive of unfavorable OHRQoL.

Overall Age, Gender, Type of Visual Impairment, Educational status(parents), Dental Caries and TDI with C-OIDP Impact were statistically significant as P value is less than 0.05, whereas self-

perceived oral health problems, Dentofacial anomalies and Occupation(parents/family) were not statistically significant as their P-value is more than 0.05.

According to our analysis, children of unemployed parents had a negative impact on their oral health related quality of life. Poor socioeconomic status and unemployment of parents/family was associated with a decreased oral health related quality of life. So better socioeconomic status showed positive affect on OHRQoL among visually impaired children.. Our results indicate that disease had a negative impact on oral health-related quality of life of visually impaired children across all domains.

Less education and low income status of the family has badly affected the oral health status along with oral health related quality of life .

## CHAPTER V: DISCUSSION

The oral-facial region is conventionally an area of consequential concern for the individual because it draws the most attention from other people in interpersonal interactions and is the primary source of vocal, physical, and emotional communication thus Oral health has a great impact on our overall health including both physical and psychological. A very large number of research studies have been done on the oral health related quality of life of the patients, a few on effect of visual impairment on OHRQoL worldwide, but here in Pakistan none of the research studies has been done exclusively on oral health status of visually impaired children. So our study was done to see that how Visual impairment affects oral health related quality of life in patients of a tertiary eye care hospital, Rawalpindi. A standardized questionnaire C-OIDP consisting of 8 questions was used for the study in this research. As the objectives of the current study were to assess the oral health related quality of life among visually impaired children visiting a tertiary eye hospital in Rawalpindi city so of all the available OHRQoL measures, C-OIDP inventory has the ability to provide information on condition-specific impacts whereby the respondent attributes the impacts to specific oral conditions or diseases; thus, contributing to the needs assessment and the planning of oral health-care services (*Oral Health-Related Quality of Life: What, Why, How, and Future Implications - PubMed, n.d.*) Hence, we used C-OIDP questionnaire in our study.

Keeping in mind our second objective which was to assess the frequency of dental diseases among visually impaired and find out its impact on their daily activities we designed a questionnaire in which we not only asked children some questions regarding their present oral condition but also did the clinical examination to find out if respondent had any tooth decay

(cavity in teeth), toothache, sensitive teeth, , exfoliating primary teeth, tooth space (due to a nonerupted permanent tooth), fractured permanent tooth, bleeding gum, swollen gum, calculus, oral ulcers, bad breath, deformity of mouth or face, erupting permanent tooth, and missing permanent tooth. We also recorded Traumatic dental injuries which were assessed using traumatic dental injury index, and Dentofacial anomalies which were recorded using Angle's classification of malocclusion. Our study results showed that 266(69.2%) visually impaired children had traumatic dental injuries among these visually impaired children. Most common traumatic dental injuries were enamel fracture 137(35.7%) and subluxation 69(18.0%). While Avulsion 32(8.3%) Extrusive luxation 21(5.5%) and Lateral luxation 7(1.8%) were the least common traumatic dental injuries seen in visually impaired children. Angle's Class I molar relation 188(49%) was reported as the most common malocclusion seen in such patients. Results showed that frequency of Angle's Class II molar relation was 79(20.6%), where as Angle's Class III molar relation was reported as the least seen type of malocclusion 32(8.3%). Among dentofacial anomalies , Crowding (42.7%) was seen as most common in the study group and posterior open bite and anterior open bite were the least common. [Table 2]. The most commonly perceived oral health problem among visually impaired group was toothache, while on the other hand, Oral Ulcer, Bad breath, Erupting Permanent Tooth and Missing Permanent Tooth as the least perceived oral health problem. Toothache was the most common oral condition affecting almost all the daily activities and had maximum impact on sleeping, studying, and eating.

72.9% of the participants in the current study had dental carries. It was more than that seen in a similar study conducted among institutionalized visually impaired children in South India by

Reddy and Sharma (Reddy & Sharma, 2011) in 2011, where the caries prevalence was 40% and mean DMFT/deft was 1.1 and 0.17. Another study conducted by (Chand et al., 2014) in 2014 in Indore, Madhya Pradesh, had found mean DMFT/deft of 0.97/0.46 in visually impaired children. This was in accordance with the results reported in our study. Furthermore, similar studies conducted in central India (Udaipur) by (Jain et al., 2013) in 2013 where mean DMFT/deft was 1.9/1.7 in visually impaired had similar results for dental caries prevalence as that present in our study. (Sanjay et al., 2014) in 2014 conducted a study in Maharashtra which also showed similar results with mean DMFT/deft of 2.1/2.0 in visually impaired population.

According to our results our study group had the the highest prevalence of Class I molar relation (49%). Our results were almost similar to the results reported by Avasthi *et al.* in 2011 in sensory impaired children in Delhi-Gurgaon region where they had used similar parameters to check for dentofacial anomalies.(Avasthi et al., 2011)

Crowding was most commonly seen dentofacial anomaly in the study group present in 42.7% of the study population. These results corroborate with survey carried out by (Avasthi et al., 2011) in 2011 in Delhi – Gurgoan region and (Muppa et al., 2013) in south India in 2013, which reported that there was anterior crowding in 27.37% of the total sample size, deep bite in 20.5%, Class I in 14.34%, anterior spacing in 12.9%, Class II in 9.95%, Class III in 5.33%, anterior crossbite in 4.98%, and open bite in 4.62% (Muppa et al., 2013) The discrepancy in the percentages could be because of difference in the genetic pattern of both the study populations.

In our study, the visually impaired group had more occurrence of TDI at 69.2%. This was similar to that reported by (Agrawal et al., 2013) in 2013 and (Avasthi et al., 2011) in 2011 in Delhi



region. Another study conducted by Bhat *et al.* in 2011 in Udaipur showed a prevalence of 33% of traumatic dental injuries among 12–15 year age group (Bhat et al., 2011) A probable cause for this variation in prevalence could be the difference in the sample size and facilities and supervision present at the institution.

In our study, eating was the most common performance affected by poor oral health as per C-OIDP inventory. This was similar to the results seen for normal school-going children aged 12–15 year in a survey done by (Usha et al., 2013) in 2013 using C-OIDP questionnaire and also in another survey done among the National Cadet Corps aged 12–15 years of Udupi district, India, in 2013 using C-OIDP inventory (Pentapati et al., 2014)

Our results indicate that the C-OIDP impact showed a weak positive correlation with Dentofacial anomalies and Traumatic dental injuries and a weak negative correlation with Age, moderate negative correlation with Type of visual impairment and a strong negative correlation with gender. The male participants tended to have higher C-OIDP scores as compared to females thus suggesting less favorable OHRQoL in males as compared to females. Children who presented with dentofacial deformities, dental caries, and traumatic dental injuries reported higher C-OIDP scores suggestive of unfavorable OHRQoL

There was only one study conducted in Khartoum state, Sudan by (Tagelsir et al., 2013) in 83 visually impaired children where they tested the C-OIDP questionnaire. They found an impact of 1.8 in their population. Probable difference noted here may be due to huge difference in the sample size.

### ***Limitations of the Study:***

This was a cross-sectional study which was done in only a tertiary eye care hospital in Rawalpindi as such there may be differences in oral health related quality-of-life scores of people living in other areas of Punjab due to social and cultural differences and also the quality of healthcare available, affordability and accessibility to healthcare centers and differences in income. Therefore the findings of this study cannot be generalized over the whole population living in either Punjab and in Pakistan. Relationship and association of co-morbidities was not studied in this study. In future there is a need to study the effects of co-morbidities on the oral health-related quality of life in detail.

## **CHAPTER VI : POLICY IMPLICATIONS AND WAY FORWARD**

The results of this study show that the oral health related quality of life of visually impaired patients is severely affected. In Pakistan a lot of different studies have been done on prevalence or incidence of visually impaired children but very little work has been done on the oral health quality of life of these patients. This study will help to identify challenges faced by visually impaired children in maintaining their oral health related quality of life and measure the oral health related quality of life and socio-demographic factors associated with the quality of life of these patients. It has pointed out the domains in which the oral health related quality of life of these patients is affected and pointed out the interventions which are needed to be introduced to improve the OHQOL of these patients. For example, by implementing special oral health care measures for visually impaired children should be our first priority. Our main focus should not be only the clinical aspects of the diseases but it should be changed to encompass all the socio-cultural and psychological domains enabling the health care providers to manage other mental and physical effects that are caused by the disease.

The affected persons are unable to do normal activities of life due to extreme pain(toothache) their sleep is severely disturbed which results in fatigue and a never-ending cycle of declining physical health. Their social relationships take a toll. Due to the disease, the patients are excluded from social events, their social activities become very limited. It has lasting effects on their quality of life. Effective improvements in oral health related quality of life of the patients require a multifaceted approach. The results gained from this study recommend that effective information campaigns should be carried out in electronic and print media to inform people about the disease in order to enhance awareness. Pamphlets and informational brochures should

be distributed in the hospitals to increase the general public's knowledge about the disease which will be effective in increasing their psychological health.

## APPENDIX A



**AL-SHIFA SCHOOL OF PUBLIC HEALTH  
PAKISTAN INSTITUTE OF OPHTHALMOLOGY  
AL-SHIFA TRUST, RAWALPINDI**

MSPH/001/001  
27<sup>th</sup> Dec, 2011

### TO WHOM IT MAY CONCERN

This is to certify that **Mahum Tanweer D/O Tanweer Fazal** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **"Oral health related quality of life among usually impaired children, visiting tertiary eye care hospital Rawalpindi"**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish  
Head

Al-Shifa School of Public Health, PIO  
Al-Shifa Trust, Rawalpindi

## Appendix B – Consent Form

The written consent form given to respondents for signing.

### **Informed Consent**

**Title of study:** “Oral Health-related Quality of Life among visually impaired children visiting a tertiary eye hospital in Rawalpindi city

#### **Researcher:**

- Dr Mahum Tanweer. MSPH student, Alshifa School of public health Rawalpindi.

#### **Purpose:**

- The Purpose of this study is to assess “Oral Health-related Quality of Life among visually impaired children visiting a tertiary eye hospital in Rawalpindi city and to Explore the factors affecting their relationship and ultimately the well-being of the patient.

#### **Procedure:**

- Interview based questionnaire will be filled by the researcher for this study along with clinical examination of the patient clinical examination will be done to record data.

#### **Time required:**

- It is anticipated that it will take approximately 45 to 60 minutes of your time to complete the interview.

### **Voluntary participation:**

- Participation in this study is voluntary. You have the right to not open or complete the anonymous survey.

### **Confidentiality:**

- Data from the surveys will be completely anonymous and reported in aggregate form. Your name will not be collected at any time. After data collection, the interview and demographic responses will be password-protected. Once submitted the researcher will not be able to withdraw responses due to anonymity and de-identified data.

### **Risks:**

- This study will pose not harmful risk to the participants.

### **Benefits:**

- There are no direct benefits associated with participation in this study. The potential benefit from this research is to assess the issues and needs of visually impaired children regarding in maintaining their oral health, which ultimately affects their development of and in maintaining of social interactions.

### **Payment:**

- You will receive no payment for participating in the study.

### **Right to withdraw from the study:**

- You have the right to withdraw from the study at any time without penalty.
- If you have questions about the study, contact the following individual:

*Dr Mahum Tanweer*

*mahamtanvir99@gmail.com*

*Contact # 03315249616*

- If you have read the above Performa and are willing to participate in the study, please sign below.

Signature of Researcher \_\_\_\_\_

Signature of In-charge hospital \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_



## Appendix C – Questionnaire

### **Oral Health-related Quality of Life among visually impaired children visiting a tertiary eye hospital in Rawalpindi city.**

#### **SECTION –A: Socio-demographic characteristics**

(Instructions: Please complete this section by circling the following answers)

1. What is Your Age?
  
2. What is Your Gender?
  - a. Male
  - b. Female
  
3. Area of Residence?
  - a. Rural
  - b. Urban
  
4. Which type of visual impairment you are suffering from?
  - a. Partial vision impairment.
  - b. Complete vision impairment:
  
4. What is your relationship with the child? (parents/family),
5. What is Your Education Level? (parents/family),
  - a. Illiterate
  - b. Primary
  - c. Matric
  - d. Intermediate
  - e. Bachelors
  - f. Masters
  - g. Post-graduation
6. What is Your Economic Status? (parents/family),
  - a. Less than 50,000rs
  - b. More than 50,000rs

**SECTION –B : WHO  
C-OIDP Questionnaire**

**1.Are you having difficulties in eating (biting, chewing)?How often during the past 3 months , have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**2. Are you having difficulties with speech or word pronunciation? How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**3.Are you having problems washing your mouth due to mouth related issues?? How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**4.Have you had sleepless nights due to toothaches or other mouth related issues? ? How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**5.Did you feel ill because of problems inside your mouth? How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0

- b. Very little-1
- c. Pretty much-2
- d. Quite a lot

**6. Do you avoid smiling or showing your teeth because of problems inside your mouth??  
How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**7. Have toothaches or mouth related problems ever prevented you from attending schools?  
How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**8. Have your problems with teeth prevented you from meeting with your friends or from other social activities? How often during the past 3 months, have you encountered these difficulties?**

- a. Not at all - 0
- b. Very little-1
- c. Pretty much-2
- d. Quite a lot -3

**SECTION-C**  
**Clinical examination**

DMFT INDEX

17	16	15	14	13	12	11	21	22	23	24	25	26	27
47	46	45	44	43	42	41	31	32	33	34	35	36	37

DT=           , MT=           , FT=            DMFT Score =

D = Decayed teeth.

M =Missing /Extracted teeth due to caries.

F = Teeth that have been previously filled due to carries.

CODE	CRITERIA
E	Excluded tooth
1	sound
2	Filled tooth
3	Decayed tooth
0	Missing tooth
X	Extracted

**2. deft index (Gruebbel,1944) for primary dentition:**

d = number of deciduous decayed teeth

e= deciduous teeth extracted due to caries

f= restored teeth without recurrent decay

55	54	53	52	51	61	62	63	64	65
85	84	83	82	81	71	72	73	74	75

**3.Traumatic dental injury (TDI) index (based on WHO classification of dental trauma):**

Traumatic dental injury	PRESENT	ABSENT
Concussion		
Lateral luxation		
Intrusive luxation		
Extrusive luxation		
Avulsion		
Enamel fracture		
Dentine enamel fracture		
Pulp exposure		
Subluxation		

**4.Angle's classification:**

<b><u>Class I malocclusion</u></b>	A normal molar relationship is present, but there is crowding, misalignment of the teeth, rotations, cross-bites, and other alignment irregularities.
------------------------------------	---

<p><b><u>Class II malocclusion</u></b></p> <p><b>Class II, Division 1</b></p>	<p>The mesiobuccal cusp of the maxillary first molar occludes anterior to the buccal groove of the mandibular first molar. Class II is categorized into two further parts:</p> <p>The anterior maxillary teeth are tilted forward or proclined, presenting a large overjet.</p>
<p><b>Class II, Division 2</b></p>	<p>The anterior maxillary teeth are retroclined, creating a deep overbite.</p>
<p><b><u>Class III malocclusion</u></b></p>	<p>The mesiobuccal cusp of the upper first molar falls posterior to the buccal groove of the lower first molar.</p>

CONDITION	TYPE	PRESENT	ABSENT
MALOCCLUSION	Class I malocclusion		
	Class II malocclusion		
	Class III malocclusion		
DIFFERENT TYPES OF DENTO FACIAL ANOMILIES	Anterior open bite		
	Posterior open bite		
	Anterior crossbite		
	Posterior crossbite		
	Deep bite		
	Crowding		
SELF -PERCEIVED ORAL HEALTH PROBLEMS	Toothache		
	Sensitive tooth		
	Tooth decay, hole in tooth		

	Exfoliating primary tooth		
	Tooth space due to non-erupting permanent tooth		
	Fractured permanent tooth		
	Bleeding gums		
	Swollen gums		
	Calculus		
	Oral ulcer		
	Bad breadth		
	Erupting permanent tooth		
	Missing permanent tooth		

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