

Oral Health Knowledge, Practice and Oral Hygiene Status Amongst visually Impaired Student in Sulaimani city/ Iraq

Shokhan H. Ali¹, Aram M. Hamad², Faraedon M. Zardawi², Awder N. Arif³

¹(Department of dental nursing, Sulaimani Polytechnic University, Sulaimani,, Iraq)

²(Department of Periodontics, School of Dentistry/ University of Sulaimani, Iraq)

³(Department of Orthodontics, School of Dentistry/ University of Sulaimani, Iraq)

Abstract:

Introduction: There is no information available regarding the dental health care and needs of visually-impaired individuals. Such information is important to improve the oral health in these special need persons.

Aims and Objects: The aims of this study are to check the oral health status and determine attitude of visually-impaired person toward dentistry.

Materials and Methods: Fifty visually-impaired volunteers were screened in Basic Runaky Institute for visually impaired and the oral hygiene status were checked by group of dentist at the same time. The attitudes of participants toward dental health were collected interview questionnaire.

Results: The data of this study shows that most of visually-impaired participants have poor to fair oral health status (38%) of them have tooth brushing at least once a day. Family shows to have great impact of these people on their attitude about oral health (62%) followed by advice from school (18%). Finally, Majority of the participants tends to rely upon themselves for their oral hygiene measures.

Conclusion: The findings of this study revealed that visually impaired individuals have poor oral health status so a little extra care by the parent or caretaker regarding oral hygiene can give further improvement and dental health care can be instituted to the parents including brushing techniques at a very early age.

Keywords: visually impaired, Oral health.

I. Introduction

Blindness is defined by World Health Organization as having a: "visual acuity of less than 3/60 m or corresponding visual field loss in the better eye with the best possible correction ", meaning that whilst a blind person could see a distance of 3 m, a non-visually impaired person could see 60 m. Visual impairment relates to a person's eyesight which cannot be corrected to normal vision.

The WHO estimates that there are 40 million blind persons in the world. Visually impaired individuals cannot visualize the plaque on the teeth surface, so even understanding the importance of oral hygiene is difficult for them which result in progression of dental caries as well as inflammatory disease of the periodontium (Mann et al, 1977) ¹.

Oral health education has been shown to have a positive impact in decreasing plaque score (Zehaati and Motlagh, 2006) ².

Visual impairment may impact on oral health through physical social or information barrier related to the impairment, attendant medical conditions or lack information in a suitable format. Other obstacles include lack of services, lack of transport, inadequate resources or financial considerations, lack of social awareness, or lack of education and training of service provider ^{3,4}. There are very few studies that have examined the health information needs of visually impaired individuals and even fewer have investigated the dental health information needs of this group ⁵. In relation to dental prescribing, the European commission has recognized the need for pharmaceutical information to be more accessible to people with visual impairment ⁶. This applies equally to a dentist who may be prescribing medications to visually impaired adults.

Oral health is an important aspect of overall health, for all children, and, is particularly more important for children with special health needs. The oral health of children who are visually impaired tends to be compromised as they are at a disadvantage and are often unable to adequately apply the techniques necessary to control plaque ⁷. Dental caries is the most prevalent disease among children worldwide and dental treatment is the greatest unattended health need of the disabled, particularly more so, in those with special health needs ⁸. The presentation of caries is highly variable; however, the risk factors and stages of development are similar.

The oral health of disabled people may be neglected because of a focus on their disabling condition, other major disease(s) or limited access to oral health care. It has been reported, "dental treatment is the greatest unattended health need of the disabled" ⁹. Some of the reasons for this may be inadequate recall systems,

practical difficulties during treatment sessions, the socio-economic status of the disabled person, pain, underestimation of treatment needs, communication problems and poor patient cooperation.

Visual impairment was the most frequently occurring disability, followed by speech, hearing, movement and mental disabilities¹⁰. In poor societies, many disabled persons find it difficult to survive; nutritional status is very low and services are inadequate and hence disabled people often live in extreme poverty, misery and despair, leading to dependency and deprivation¹⁰.

The prevalence of blind children globally is estimated to be 1.4 million, three-quarters of whom live in the poorest regions of Africa and Asia¹¹. In low-income countries, the prevalence of childhood blindness may be as high as 1.5 per 1000 children¹². Such a high prevalence, alongside poor management of resources may result in huge impacts. Childhood blindness impacts negatively on longevity, with up to 60% of blind children dying within one year of losing their eyesight¹³. Early-onset blindness may impact psychomotor, social, and emotional development thus adversely affecting the visually impaired young child¹¹.

Childhood blindness in developing countries is a result of acquired factors such as measles, ophthalmia neonatroum, traditional eye medicine, and especially corneal scarring related to malnutrition and vitamin A deficiency¹¹. A study conducted in five camps for internally displaced people in Khartoum, Sudan, reported a prevalence of 1.4 per 1000 children suffering from blindness. In this case, the reported leading cause was corneal opacities (40%), from vitamin A deficiency, trauma, or measles. Opacities were followed by amblyopia (32.5%)¹⁴.

Poor oral hygiene, gingivitis and periodontal diseases have been reported among visually impaired children in studies from India^{15,16,17}, Iran¹⁸, and Turkey¹⁹. Mann et al. suggested that this could be due to their inability to visualize the plaque on tooth surfaces resulting in inadequate plaque removal and therefore the progression of dental caries and inflammatory disease of the periodontium²⁰. Shetty et al¹⁷ proposed other factors such as lack of manual-visual coordination and parental supervision, and the child's reduced concern for his/her appearance¹⁷. There are very few studies addressing the impact of the severity of visual impairment on oral health of blind children. While all studies were in agreement that children with partial visual impairment have better oral hygiene than those with complete visual impairment, caries experience was not significantly different amongst the two groups of blind children¹⁷.

There is little information available regarding the dental health care and needs of such individuals. Such information is important to improve the oral health in these special need individuals. The aim of this study was to investigate the oral health knowledge, practice, oral hygiene status and the prevalence of dental caries among blind student in Sulaimani city-Iraq.

II. Materials and Methods

The study was conducted among Runaky Institute for vision impaired in Sulaimani city from first grade children to ninth basic class. The sampling technique was convenience. All vision impaired individual attending the governmental institute "male and female" from first to 9th grade were included. Any child with combined disability was excluded. An interview questionnaire was carried out amongst students in the classroom. The clinical exam forms were attached to the questionnaires. Each student keeps the questionnaire with him/her for the examiner to record the clinical exam on the same form.

Before undertaking periodontal examination, volunteers with medical and dental history that might affect oral hygiene performance excluded. Oral hygiene was assessed using the Simplified Oral Hygiene Index (OHI-S) of Green and Vermillon (1964)²¹. Codes for the Debris index were as follows: 0= Absence of debris or extrinsic stain, 1= debris covering not more than one third of the tooth surface, 2= debris covering more than 1/3 but not more than 2/3 of the tooth surface regardless of the presence of extrinsic stain, 3= Soft debris covering more than two thirds of the examined tooth surface. Accordingly the oral hygiene of each child was classified as good, fair, or poor. Scores for OHI-S values were as follows: poor (≥ 2), fair (1.0 – 1.9) and good (≤ 0.9). The poor and fair categories were combined to describe 'poor' oral hygiene.

Periodontal examination was performed on Ramfjord teeth, the six teeth of Ramfjord were examined for the presence and absence of dental plaque and gingival index using Michigan dental probe²². The facial, lingual, mesial and distal surfaces of every tooth were examined. If any tooth missed, the adjacent tooth was examined instead. The means of dental plaque and gingival index were calculated by dividing the sites that exhibit dental plaque or gingival bleeding by total number of sites.

The interview questionnaire included questions about the oral health status, the mode of tooth brushing, the means used for cleaning teeth, when and who help if needed, the use of dental floss and the tooth cleaning frequency, methods used for brushing, visit to dentist (The reason behind seeking the dentist was also assessed for check-ups or pain only) and how they learned to brush their teeth (from school, television, and home). An educational health program was done to the school students through oral short story, data show and models. Ethical approval was obtained from the Sulaimani Poly-technic University Research Ethics Committee.

The data analysis was carried out by SPSS software version 16. T-test and one-way ANOVA used to compare between groups. P-value of ≤ 0.05 considered as statistically significant.

III. Result

A total of 50 visually-impaired participants (34 males- 16 females) aged between 7yrs to 29 years from Basic Runaky institute Upon the field trips were recruited.. The participants were examined for Plaque index, gingival index (Table 1) and Oral hygiene index (Figure 3), information on oral hygiene practice, attitude were collected by an interview questionnaire. They were divided into two age groups (as shown in table 2). Majority of participants were belongs to age group of below 15 years old. Each individual had interview questionnaire regarding oral hygiene practice, attitude and knowledge.

Mean Plaque index was 1.92 ± 0.81 it was statistically not significant in both age group (table 1). However, no statistical significant differences were found between genders. On the other hand, 62% of participants had plaque index of 0-1, whereas, 22% of them had maximum plaque index and only (16%) had plaque index of $>1-2$ (Fig. 1).

Mean Gignival index was 1.45 ± 0.68 it was statistically not significant in both age group (table 2). However, no statistical significant differences were found between genders. On the other hand, 46% of participants had Gingival index of $>1-2$, whereas, 16% of them had maximum gingival index and only (38%) had gingival index of 0-1 (Fig. 2).

Above half percent (60%) of them had a poor oral hygiene, while 22% of visually-impaired volunteers had fair oral hygiene and only (18%) of them good oral hygiene (Fig. 3). Furthermore, majority of participants (70%) doing their teeth brushing by their own and 22% of them need help from their mother (Fig. 4). The data revealed that all participants had tooth brushing and 38% of the had the brushing once a day, while, 28% of them had the brushing twice a day and more interestingly 12% of them had brushing more than twice a day and 22% of them had irregular brushing (fig.5). On the other hand, family seems to have a great impact on educating visually-impaired subjects (62%) followed by school (18%), TV (8%) and 12% from other non-specified sources (fig. 6). Horizontal technique of brushing shows to be higher (%70) than vertical technique (%30). Majority of visually-impaired participants (60%) were use floss as a mean of cleaning their teeth and it is also shown that only 44% of these participants had visit to dentist on regular basis.

IV. Discussion

Dental disease are one of the common problems found in community, oral health care is important to all normal individuals for proper mastication, digestion, appearance and speech but it even more important for handicapped individuals. The process of developing oral disease, prevention and treatment modalities does not differ in handicapped individual from normal individuals. A Study completed by chang and shih found that student with visual impairment were less knowledgeable about their oral care²³.

It was seen in the institutes for visually-impaired that the number of males was higher than that of the females. Among 50 subjects, 34 were male and only 16 of them were female and this is in line to the study carried out by Manish et al 2013²⁴. This may be contribute to the educational development of a family. This study revealed that no significant relation between the mean of plaque index 2.04/1.8 and gingival index of both gender 1.5/1.41 respectively. Also the age group distribution revealed that there was no significant difference between age groups and i agree with Alhazmi et al 2014²⁵ that showed no significant relation of plaque index according to gender and age.

Plaque index was 62% have 0-1 soft debris accumulation while 22% have $>2-3$ soft debris accumulation and only 16% have $>1-2$ soft debris accumulation, also gingival index was 46% have $>1-2$ gingival inflammation while 38% have 0-1 of gingival inflammation and only 16% have maximum gingival inflammation $>2-3$, this might because the visually impaired individual cannot visualize the plaque on their tooth, So we need to improve the education modalities to visualize the preventive ways of oral disease and permit for the visually impaired to apply it perfectly.

In this study most of the individuals found that have poor oral hygiene 60%, but at the same time 22% of students fair oral hygiene but only 8% of them good oral hygiene agree with Solanki et al. 2013²⁶ and Ahmed et al. 2009²⁷ that showed poor oral hygiene among blind individuals. This may be due to lack of proper oral hygiene and difficulty of these individuals to see and remove plaque or could be attributed to lack of assistance or super vision of care givers during performance of oral hygiene practices.

The interview questionnaire revealed that 70% they are independent in brushing their teeth without any help, while 22% helped by mothers and 8 % helped by father and only 60% use dental floss and 40% never use dental floss. Because most of the individuals above 9 years old they don't need help for brushing of their teeth only few of them need help because they may be didn't learn to brush their teeth properly.

Brushing Frequency revealed that 38% brush their teeth once per day and also 28% brush their teeth twice per day while 12% brush more than twice and 70% of students use horizontal brushing method while 40%

of them use vertical brushing method because 62% of individuals learned brushing through their families which they may be didn't learn them to brush their teeth in correct way. Therefore dental health education should be provided to parents and school teachers, to improve the oral health of this social group, motivation and the senses particularly that of touch must be utilized when the blind are instructed in oral hygiene methods.

V. Conclusion

The present study shows although this study population had vision impairing, that had bad oral health status. dental health care can be instituted to the parents, including brushing techniques at a very early age. However, an effective dental health education method has not been well instituted for visually impaired children; Therefore, the importance of a preventive approach and the critical role of the dentist in providing proper dental education to parents of individuals with disabilities. In addition, the oral hygiene habits of individuals with disabilities can be improved by close monitoring and periodic dental check-ups. Further studies recruiting more subjects and have control group to compare normal from one side and education mode that can be best perceived by visually impaired children from other side are necessary.

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References

- [1]. Mann J, Wolnerman JS, Lavie G. "Periodontal treatment needs and oral hygiene for institutionalized individuals with handicapping condition" *Spec Care Dentistry* no 4 (1984): 173-176.
- [2]. Zehaati H, Ghandhasi M, Motlagh M "An investigation on DMFT & DMFS of first permanent molars in 12 yr old blinds in Tehran, iran". *J. med.sci* 6, no. 1 (2006;): 1-4.
- [3]. Lebowitz E J. "An introduction to dentistry for the blind". *Dent Clin North Am* 18 (1974): 651-659.
- [4]. Edwards D M, Merry A J. "Disability part 2: access to dental services for disabled people. A questionnaire survey of dental practices in Merseyside". *Br Dent J* 193 (2002): 253-255.
- [5]. Beverley C A, Bath P A, Booth A. "Health information needs of visually impaired people: a systematic review of the literature". *Health Soc Care Community* 12 (2004): 1-24.
- [6]. European Commission (2004). http://ec.europa.eu/enterprise/sectors/pharmaceuticals/files/pharmacos/docs/doc2005/04_05/braille_text20050411_en.pdf
- [7]. Vabitha S, Amitha H, Srikala B, Kavita R. "Oral Health Status of the Visually Impaired Children – A South Indian Study". *Journal of Clinical Pediatric Dentistry* 34 no. 3 (2010): 213-216.
- [8]. Doshi. J J ,Patel U K,Venkata Krishnan H. "Bhatt.Dental cleanliness in handicapped blinds and the role of dentist". *Journal of Indian Dental Association* 53 (1981):179-182.
- [9]. Nowak AJ. "Dental care for the handicapped patient-past, present, future. In: Nowak AJ, editor. *Dentistry for the Handicapped Patient*". 1st ed. St.Louis, MO: CV Mosby; (1976) p. 3-20.
- [10]. Dinesh Rao B, Arnitha Hegde M, Munshi AK. "Caries prevalence amongst handicapped children of South canara, India". *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 4 (2001): 67-73.
- [11]. World Health Organization. Preventing blindness in children. Report of a WHO/IAPB scientific meeting. WHO/PBL/00.71. Geneva: WHO; 2000.
- [12]. Prevention of Blindness and Visual Impairment. <http://www.who.int/blindness/causes/priority/en/index4.htm>.
- [13]. Gilbert C, Awan H. "Blindness in children". *BMJ* 327 no. 7418 (2003):760-761.
- [14]. Zeidan Z, Hashim K, Muhit MA, Gilbert C. "Prevalence and causes of childhood blindness in camps for displaced persons in Khartoum: results of a household survey". *East Mediterr Health J*. 13 no. 3 (2007): 580-585.
- [15]. Reddy K, Sharma A. "Prevalence of oral health status in visually impaired children". *J Indian Soc Pedod Prev Dent*. 29 no. 1 (2011): 25-27.
- [16]. Nandini NS. "New insights into improving the oral health of visually impaired children". *J Indian Soc Pedod Prev Dent*. 21 no. 4 (2003): 142-143.
- [17]. Shetty V, Hegde AM, Bhandary S, Rai K. "Oral health status of the visually impaired children—a south Indian study". *J Clin Pediatr Dent*. 34 no. 3 (2010): 213-216
- [18]. Ahmad MS, Jindal MK, Khan S, H. HS: "Oral health knowledge, practice, oral hygiene status and dental caries prevalence among visually impaired students in residential institute of Aligarh". *J Dent Oral Hyg*. 1 no. 2 (2009): 022-026.
- [19]. Bekiroglu N, Acar N, Kargul B. "Caries experience and oral hygiene status of a group of visually impaired children in Istanbul, Turkey". *Oral Health Prev Dent*. 10 no.1 (2012): 75-81.
- [20]. Mann J, Joseph SW, Lavie G, Carlin Y, Garfunkel AA. "Periodontal treatment needs and oral hygiene for institutionalized individuals with handicapping conditions". *Spec Care Dentist* 4 no. 4 (1984): 173-176.
- [21]. Greene JC, Vermillion JR. The simplified oral hygiene index. *J Am Dent Assoc*. 1964;68:7-13.
- [22]. Walmsley A, Walsh T, Burke F, Shortall A, Lumley P, Hayes-Hall R. *Restorative Dentistry* (London: Elsevier, 2002).
- [23]. Chang CS, Shih Y. Knowledge of dental health and oral hygiene practice of Taiwanese visually impaired and sighted students. *J visual impairment blindness* 2004;98:1-27.
- [24]. Manish Jain, Surya Prakash Bharadwaj , Laxman Singh Kaira , Devendra Chopra ,Duraiwamy Prabu, Suhas Kulkarni. "Oral Health Status and Treatment Need Among Institutionalised Hearing-Impaired and Blind Children and Young Adults in Udaipur, India. A Comparative Study" *OHDM* 12 no. (2013).
- [25]. Alhazmi A, Alshinqiti I, Aloufi F, Alhejali A, Alsulaimani W, Alharbi M. Oral Health Knowledge, Practice, Oral Hygiene Status and Dental Caries Prevalence Among Visually Impaired Student in Alnoor Institute of Almadinah Almunawwarah at Saudi Arabia. *International Journal of Dental Sciences and Research*, 2014 2 (6), pp 149-153.
- [26]. Solanki J ,Gupta S, Arora G, Bhateja S. Prevalence of dental caries and oral hygiene status among Blind School Children and Normal children, Jodhpur city: A comparative study. *Journal of Advanced Oral Research*, Vol 4; Issue 2: May -Aug2013.

[27]. Ahmed MS, Jindal MK, khan S, Hshmi SH. oral health knowledge, practice, oral hygiene status and dental caries prevalence among visually impaired students in residential institute of aligarah. J Dent oral hygiene2009; 1: 22-6.

Table 1: Mean and standard deviation of plaque index and gingival index according to gender.

parameter	Gender		
	Male (34)	Female(16)	Total (50)
PI	2.04±0.843*	1.8±0.78*	1.92±0.81
GI	1.5±0.87*	1.41±0.49*	1.45±0.68

*non significant P-value of ≥ 0.05

Table 2: Mean and standard deviation of plaque index and gingival index according to age.

parameter	Age		
	7-14 (28)	>15 (22)	Total(50)
PI	1.81±0.52*	2.03±0.71*	1.92±0.61
GI	1.43±0.92*	1.56±0.41*	1.49±0.66

*non significant P-value of ≥ 0.05

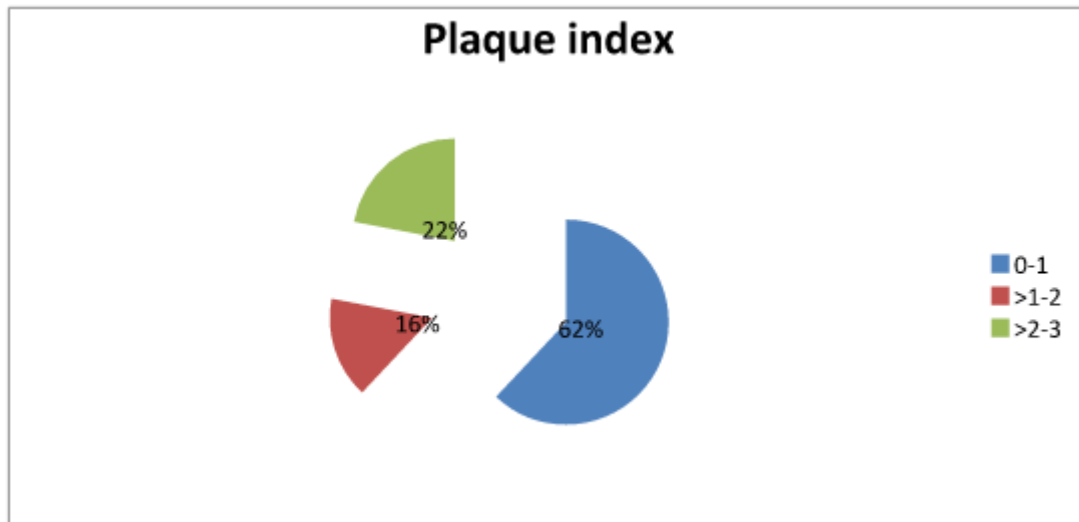


Figure 1: The percentage of plaque scores in study population.

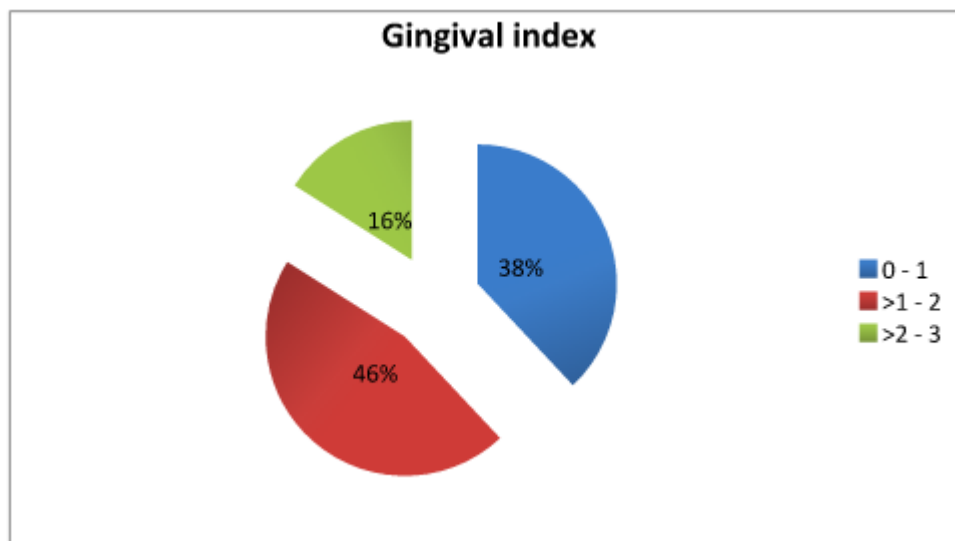


Figure 2: The percentage of gingival scores in study population.

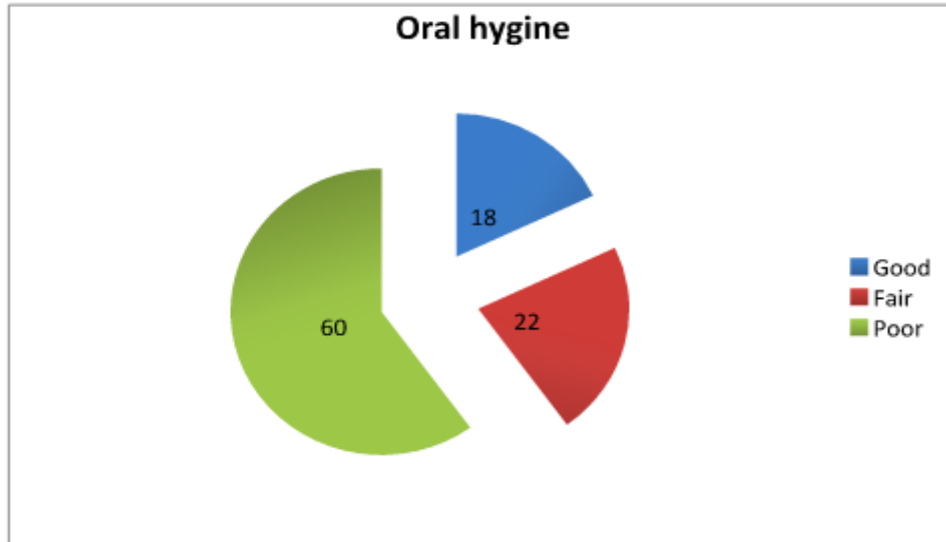


Figure 3: Distribution of oral hygiene among the participants.

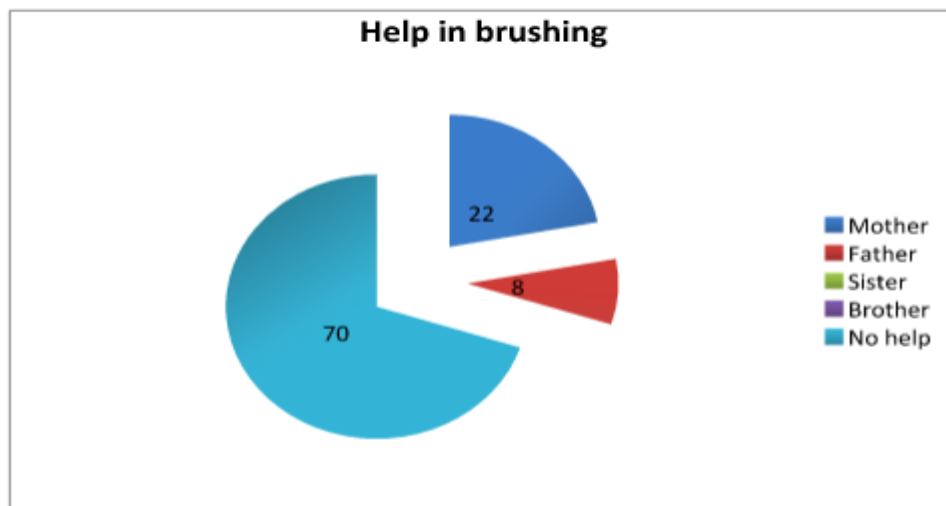


Figure 4: The prevalence of tooth brushing by help from others or not

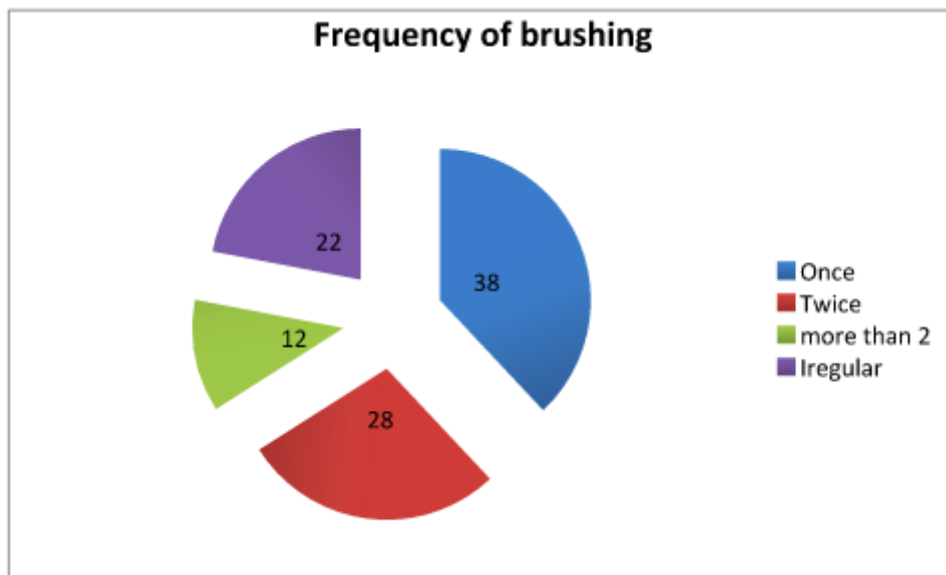


Figure 5: The prevalence of frequency tooth brushing

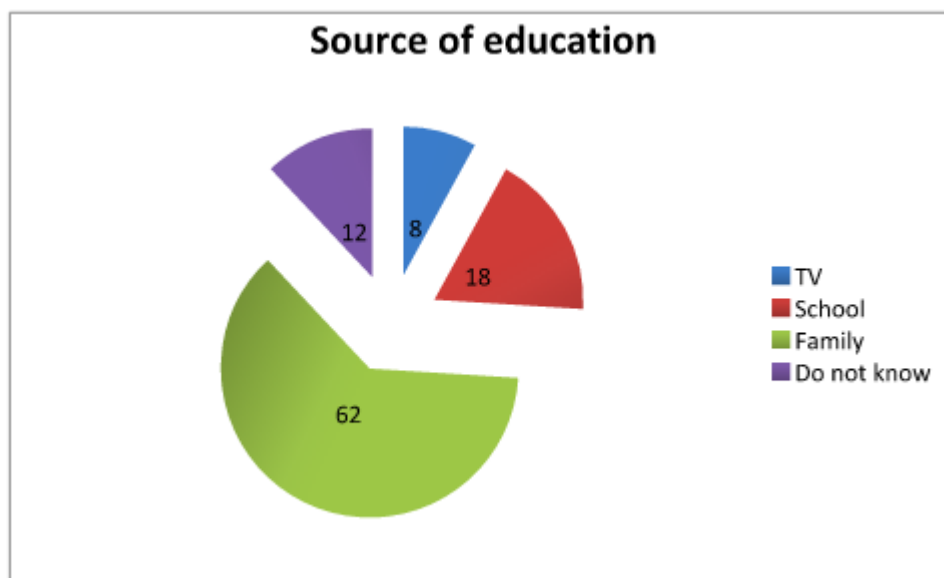


Figure 6: The prevalence of source of education.