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Effect of Training Teachers in Deaf and Mute school on Applying Oral Hygiene program on children with Hearing Disabilities

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Abstract
Background*: Oral health is sustainable part of public health of every child. Maintaining oral and dental hygiene among deaf and mute children is a difficult problem. Because oral and dental care requires high communication skills.**Aim of the study**; the aim of the study was to evaluate effect of training teachers in deaf and mute on applying oral hygiene program onchildren with hearing disabilities*
Design: *A quasi-experimental design was utilized to conduct this study.*
Setting*;the study conducted in Deaf and Mute school in Ismailia city which include three stages of education.*
Sampling:*Two samples were used in this study. A) A purposive sample consisted of 68 children fulfilled who fulfilled the study inclusion criteria. B) All teachers who contacts with children are in these age stage.*
Tools:*First tool: self-administrated questionnaires about socio-demographic characteristics for children and their teachers and questionnaire sheet about subjects' knowledge and practice of oral health and hygiene. Second tool: Simplified Oral Hygiene Index (OHI-S) for assigning scores to the tooth surfaces.*
Results*: The results revealed post training teachers on oral hygiene program improvements in total scores school knowledge and practice among children with hearing impairment. There were statistically significant improvements of overall oral index score among studied children.*
Conclusion; *children after the training provided by teachers training improved their knowledge and practices towards oral health hygiene. The majority of studied children improved oral hygiene index among studied children after three months of training program.*
Recommendations*; the involvement teachers of hearing-impaired children in the oral health education program is strongly recommended.*
Key words:*Hearing impairment, oral hygiene education, oral hygiene index scores, tooth brushing techniques*

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I. Introduction

Children with special health care need as "A child who is prevented by physical or mental conditions from fully participating in the normal activities of his or her age groups, including those with social, educational and professional entertainment"[1]. Children with disabilities differ from natural children regarding the professional relationship between children and school teachers. So with appropriate training and understanding the seriousness of lack of public health and change misconceptions can protect these children with hearing impairment from health problems[2, 3].

Globally, Hearing impairment childrenare estimated 23,000-25,000 and their ages range from 0-15 years.[4].Hearing impairment is the inability to hear as well as someone with normal hearing. There are several factors affecting hearing impairment such as heredity factor, maternal rubella, complications at birth, certain infectious diseases such as meningitis, use of autotoxin drugs, and exposure to excessive noise[5]. hearing impairment children is often neglected because of ignorance, fear, stigma, misconception and negative attitudes [6].

Dental caries and gingivitis and periodontitis increased in disabled children. Also, oral hygiene is the most prevalent dental caries among children worldwide,[1] and previous studies indicated that hearing impairment (HI) children do not have adequate oral health knowledge and oral health care which might impair the oral hygiene practice[7].

Health education for oral hygiene is a combination of learning experiences designed to facilitate voluntary actions conducive to health. The health education program and guidelines increased awareness for individuals, families, institutions or communities about health issues. Thus the scope of health education may include educational interventions for children with disability, their parents, their teachers [8]. Knowledge improvement alone does not necessarily lead to change health behaviors. However, knowledge improved may

serve as a tool to empower many groups with accurate information about health and enabling them to take action to protect their health. [6]

Teachers are considered as role model to transmit values of life.It is thus critical that theirown oral wellbeing conduct adjusts todesire of the populace [4-6]. Empowering school staff to gives schoolchildren data about wellbeing consideration that wouldhelp them to pick up learning, aptitudes also, states of mind to keep up and upgrade their oral wellbeing [8]. Apart from thisconnection, teachers are viewed as major operators in schoolwellbeing projects and absence of preparing and support makes more prominent boundary for powerful usage of school wellbeing training intercessions. Children perform practices as desired when they receive positive feedback from significant others (e.g., peers, parents, and teachers). Significant others can serve as models for children and will have strong self-efficacy if they observe successful model similar to themselves[9, 10].

Significance of the study:

Oral healthcare utilization is poor among the disabled people due to several reasons like poor accessibility to health services, dependence on caregivers, lack of adequate training of healthcare providers, the attitude of healthcare providers and finally their own low level of expectations from healthcare services[11].Individuals with special needs may have great limitations in oral hygiene performance due to their potential motor, sensory, and intellectual disabilities and so are prone to poor oral health. Hearing disorders affect the general behavior and impair the level of social functioning. This group is often neglected because of ignorance, fear, stigma, misconception and negative attitudes[12].

There is evidence to prevent and control of dental and oral disease such as tooth brushing, tongue and medical follow up. These oral habits of hygiene are acquired during the socialization process of a child. When this habit is taught in early childhood, it is naturally ingrained in the daily routine of the child, with only positive reinforcement.[13]. Preventive dental care is essential at institutions for the hearing impaired and mute population because of the high incidence of dental and periodontal disease in them[3]. Because many of these individuals are unable to maintain good oral hygiene independently, the educational component of oral hygiene must be directed toward the teachers and parents. Empowering school staff to give hearing impaired children with data about wellbeing consideration that would help them to pick up learning, aptitudes also, states of mind to keep up and upgrade their health wellbeing[8].

Aim of the study:

The aim of the study was to evaluate the effects of training teachers in deaf and mute on applying oral hygiene program for children with hearing *disabilities*

Research hypothesis:

1. After Application oral hygiene program by teachers in deaf and mute school was improved oral hygiene index among children with hearing *disabilities*.
2. After application oral hygiene program by teachers in deaf and mute school was improved oral hygiene knowledge and practices among children with hearing disabilities.

Study design: A quasi-experimental design was utilized to conduct this study.

Setting:

The study conducted in Deaf and Mute school in Ismailia citywhich includes three stages of education (primary - preparatory and secondary). The number of students in the three stages was 192 students at 2016/2017 and 27 teachers.

Subjects:

The subject of the present study all children aged in primary stage, and teachers who were teaching these children.

Sampling:

Two samples were used in this study. A) A purposive sample consisted of 68 children fulfilled these criteria, aged from 6- 12 year ,both sex, free of cognitive problem and the parents accepted to participates in this study. B) All teachers who contacts with children are in these age stage.

Tools for data collection:

Two tools were used for data collection

First tool: self-administrated questionnaires it was designed by the researcher after reviewing the relevant literature which includes three parts;

Part I: socio- demographic characteristics for children and their teachers as age, gender, parental education level, teachers' education level.

Part-II: Detailed questions about subjects' knowledge of oral health and hygiene. It consisted of 11 questions like important of oral health as a part of general health, number of milky teeth, the number of permanent teeth, and most common diseases affecting oral cavity, the reason for tooth decay and bleeding gums, and how to prevent dental problems. For each correct statement response, giving one mark and zero for incorrect statement, the marks of the items were summed-up and the total marks was 40 degree and calculated Mean and standard deviation.

Part III: oral hygiene practice sheet to assess children and their teachers' oral hygiene practice according to their habits. its consisted of following questions 1) How do you clean your teeth,2) How often do you clean your teeth 3) What type of toothbrush bristles do you use,4)Do you rinse your mouth after meals,5) How do you brush your teeth, 6)How often do you change your toothbrush, 7) Do you clean your tongue, 8) Do you use oral hygiene aids. **Scoring**: questions were answered by never, sometimes, and always. Never score was zero, sometimes scored 1 and always scored 2. The total score for the sheet 24 score. Summations for each items and calculate mean and standard deviation.

Second tool: Simplified Oral Hygiene Index (OHI-S) for assigning scores to the tooth surfaces based on***Greene and Vermillion, 1964[14]***. It has two parts.

Part I: Debris Index

To determinations representing the amount of debris according to the criteria for classifying debris as follow: 0= No debris or stain present, 1= Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered, 3= Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface, 4= Soft debris covering more than two thirds of the exposed tooth surface

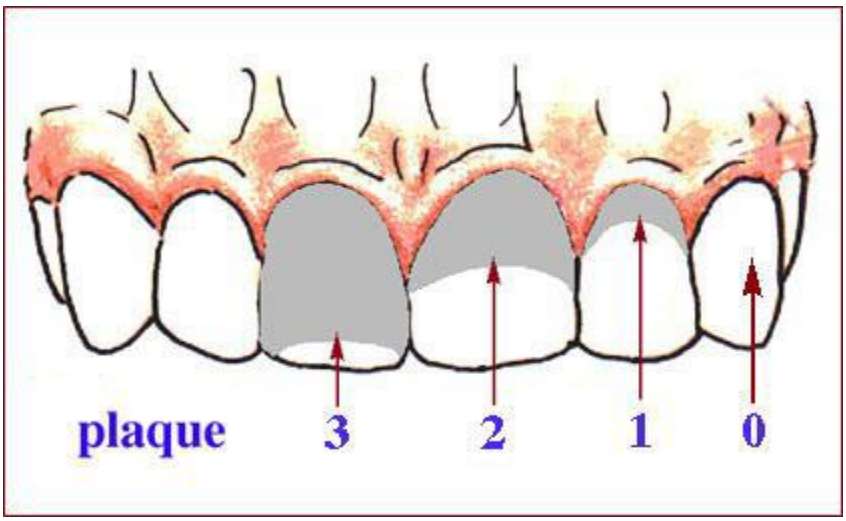


Fig (1): **Diagram of debris index scores**

Part II: Calculus Index

To determinations representing the amount of calculus found on the preselected tooth surfaces according to the Criteria for classifying calculus as follow: 0= No calculus present, 1= Supragingival calculus covering not more than third of the exposed tooth surface, 2= Supragingival calculus covering more than one third but not more than two thirds of the exposed tooth surface or the presence of individual flecks of sub gingival calculus around the cervical portion of the tooth or both, 3= Supragingival calculus covering more than two third of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth or both**.** After the scores for debris and calculus are recorded, the Index values are calculated. For each individual, the debris scores are totaled and divided by the number of surfaces scored. At least two of the six possible surfaces must have been examined for an individual score to be calculated. After score for a group of individual is obtained by computing the average of the individual scores through this

equation OHI-S= CI(s) +CD (I) and classified oral hygiene status into: (0-1.2) = good oral hygiene, (1.3-3.0) = fair oral hygiene, and (3.0-6.0) = poor oral hygiene.

Pilot study:
A pilot study was done to determine the applicability and clarity of the questionnaire form. It was conducted on 10% of the studied sample. Their numbers were seven HI children and two school teachers. These subjects were included from the study sample.

Validity:-
The study reviewed by five experts from the Faculty of Nursing and Faculty of Dentist. These experts evaluated the tool for clarity, relevance, application, comprehensiveness, and understanding. This constituted the face and content validation of the tool. All recommended modifications in the tool were done.

Ethical consideration:
The study protocol was approved by thepertinent committee of the Faculty of Nursing Suez Canal University. An agreement forparticipation of the subjects was taken verballybefore inclusion and after the aim of the studyexplained to them. They also were assured thatany information taken from them would beconfidential and used for the research purposeonly.

Fieldwork:
- Official letters were issued from Faculty of Nursing, Suez Canal University, Egypt, and sent to the directors of Deaf and Mute school get their permission for data collection from the authorized personal. The letters explained the purpose of the study, and sought their cooperation.
- Another Official letters were issued from Faculty of Nursing, Suez Canal University, Egypt, and sent to the dentist in health school unit at Deaf and Mute school get their permission to perform clinical examination for HI children under study to determined oral hygiene level during period study.
- Data were collected during the first of October 2016 to the end of January 2017.
- Before starting the data collection, the researcher met the teachers in the library room. The researcher introduced herself and explained to the teachers the purpose of the study and their consent to participate was obtained.
- The researcher distributed the baseline questionnaire to all teachers and HI children. The baseline questionnaire was distributed to assess their knowledge and practices regarding oral hygiene.
- Clinical examination was done of hearing impairment children before and after training program for their teachers to determine the oral hygiene index of each child individually by a dentist in school health unit. The examination took from 5 to 10 minutes for each child.
- The training program was started immediately after the first oral hygiene examination step of HI children, in the library room and continued step by step throughout implementation the program.
- An appointment was made for them to implement training program according to school schedule. The researcher identified program topics. The information was delivered by lecturing the teachers. Simplified lectures were prepared and it involved seven sessions: oral hygiene and their importance. Information about what to use to brush the teeth and the benefits of using toothpaste as well as the benefits of eating fruits and vegetables and drinking milk. Information about the frequency of teeth brushing (recommended three times a day). Information about the causes of tooth decay and examples of food that lead to dental decay.
- The researcher distributed for school teachers the lectures and pamphlets were very simple, joyful and with plenty of figures, illustrations, and tables, video film in order to encourage, motivation for better participation in the program.
- The researcher demonstrated steps of tooth brushing. Explaining the most suitable types of tooth brush to be used and benefits effects of regular tooth brushing on the promotion of better oral hygiene. By demonstrating method of tooth brushing through video film and how to re-demonstrate this steps of tooth brushing through mouth and teeth doll.
- The training program was divided into four sessions lasting 20-35 minutes each. The total duration of this phase of the study was 4-6 weeks. The researcher encouraged the participants to bring their parents with them to know how to support and help them in their care.
- The researcher distributed a plan to the school teachers to implement the program to students by allocating two sections per week for three months to explain the program to students according to the schedule of school hours.
- A post-test was administrated after three months from implementation of the program to assess the changes in HI children in knowledge and practices. The same tools used in the pretest were re-used.

Statistical analysis:

Data entry andstatistical analysis were done using SPSS 16.0statistical software package. Quantitativecontinuous data were compared using Student t-test in case of comparisons between two groups.When normal distribution of the data could notbe assumed, the non-parametric Mann-Whitneytest was used instead. Qualitative categorical variables were compared using chi-square test.Whenever the expected values in one or more ofthe cells in a 2x2 tables was less than 5, Fisherexact test was used instead. In order to identifythe independent predictors of the knowledge scores, multiple linear regressionanalysis was used after testing for normality, andhomoscedasticity and analysis of variance forthe full regression models were done. Statisticalsignificance was considered at p-value <0.05.

II. Results

Table 1, Distribution socio- demographic characteristic for teachers (n=27)

Items	No	%
Teacher Mean age	41.59±8.28	
Teacher gender :		
Male	12	44.4
Females	15	55.6
Teacher education level		
Bachelor	16	59.3
Diploma	11	40.7
Type of subject teaching		
Arabic	7	25.9
Mathematics	7	25.9
Social studies	5	18.5
Sciences	7	25.9
Religious education	1	3.7

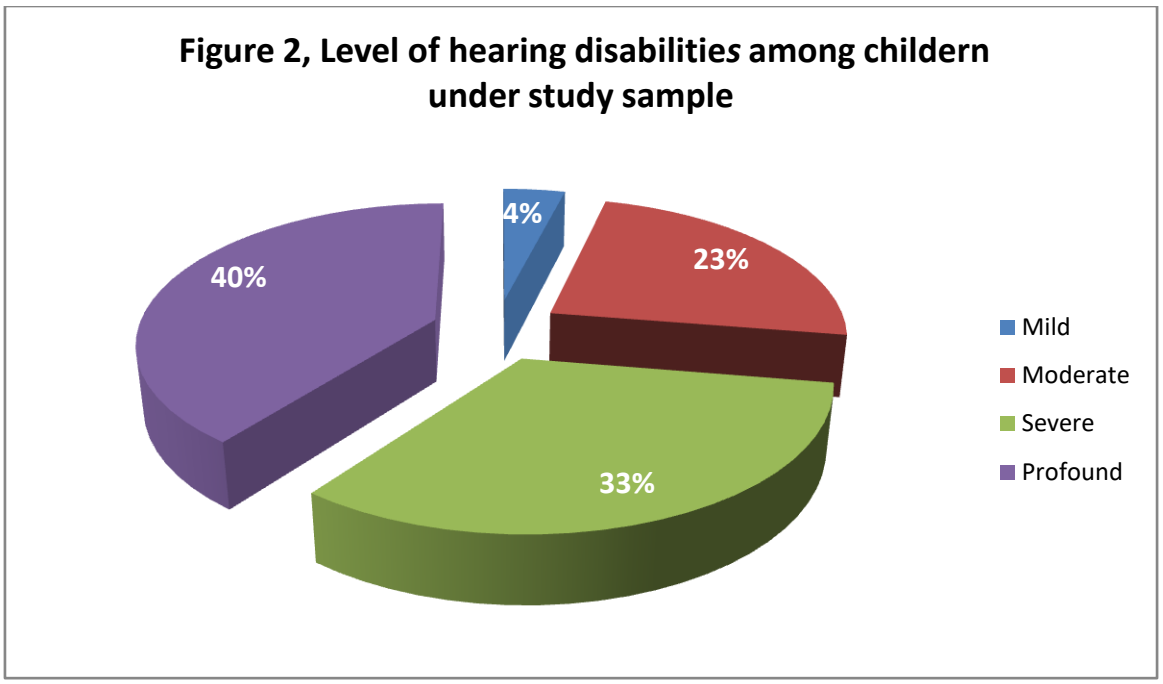
Table (1) shows that, concerning the studied teachers' mean age, is 41.59 years. It also reveals that 55.6% of the teachers are females, while 44.6% of them are males. Regarding teachers' educational level 59.3% of them have bachelor degree, while 40.7% of them have diploma degree. It also reveals that 25.9% of them teaching Arabic, Mathematics and Sciences respectively.

Table 2, Distribution socio- demographic characteristic for children (n=68)

Items	No	%
Age (years)		
10>	37	55.4
10-11	27	39.9
-12	2	4.8
Sex :		
Male	39	57.1
Females	29	23.8
Mother education level		
Bachelor	21	31.5
Diploma	34	50.0
Illiterate	19	18.5
Type of mother job		
Housewife	42	60.1
Working	26	39.9
Father education		
Bachelor	35	51.4
Diploma	26	38.2
Illiterate	7	10.4
Father job:		
Employee	41	60.2
Self –employee	26	37.4
Unemployed	1	1.4
Family monthly income:		
Not enough	21	31.5
Enough	19	18.5
Enough and saving	28	41.0

As reveals from table (2), 55.4% of studied children are aged less than 10 years. Concerning their gender, the results show that 57.1 % of them are male. As regards their mother' educational level, half of them have diploma degree. It also reveals that 60.1%of them are house wives. Concerning father's educational level,

51.4% has bachelor degree and 60.2% of them were employed. It also reveals that, 41 % of them stated that their monthly income is enough and saving.



This figure clarifies that, 40% of the studied children are having a profound hearing disabilitieslevel, while 33% of them are having severe hearing impairment level.

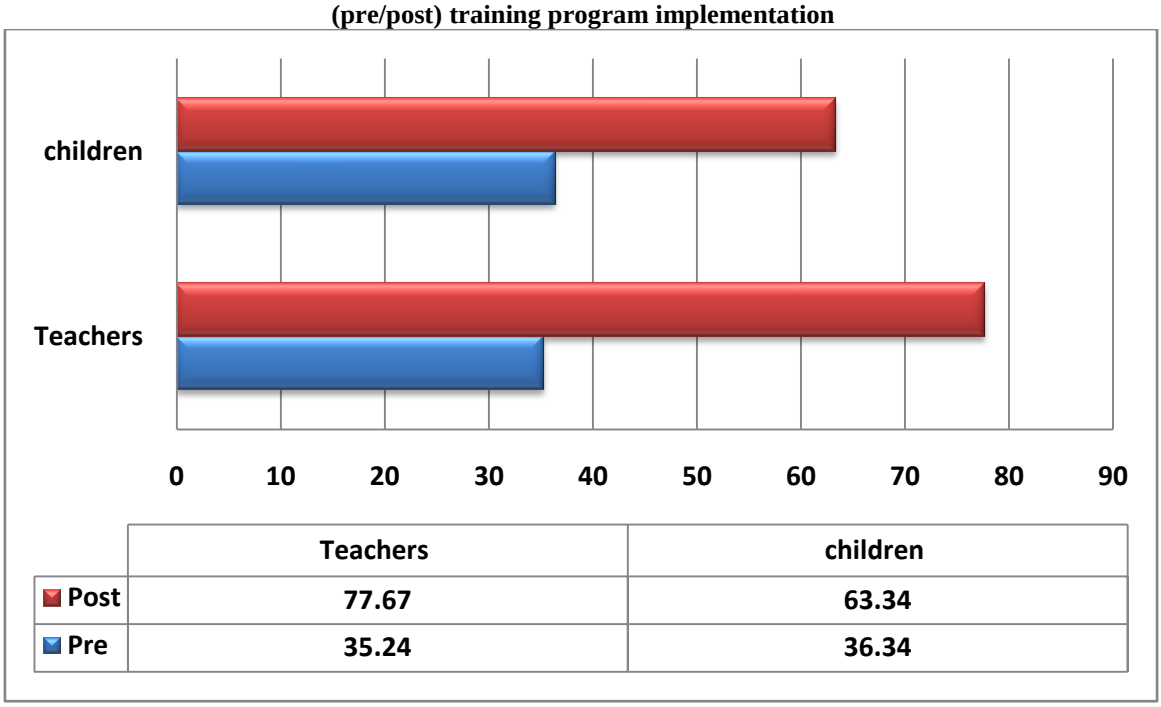
According to research hypothesis (Table 3 and 4) (figure 4,5)

Table 3, Distribution of oralhygiene correct knowledge amongstudied children(pre/post) program implementation.

Knowledge	HI children (n=68)				t- test	p-value
	pre		Post			
	Mean	**SD**	**Mean**	**SD**		
Important of oral health as a part of general health	38.77	13.8	82.17	16.53	32.9	.000*
Benefits of using toothpaste	36.47	15.1	76.67	17.57	22.82	.000*
Benefits of eating fruits and vegetables and drinking milk	35.39	21.5	73.20	19.35		.000*
Most common diseases affecting oral cavity.	31.44	18.2	76.29	20.27	19.6	.000*
Reason for tooth decay	38.99	19.1	80.48	16.22	25.36	.000*
Reason for bleeding gums	29.76	15.7	69.49	22.84	25.15	.000*
Signs of dental caries	36.34	13.1	77.67	14.34	21.98	.000*
Prevention of dental problem	33.66	19.51	59.40	15.82	28.97	.000*
Definition of fluoride	35.66	20.13	64.79	20.95	19.51	.000*
Definition of dental floss	31.18	18.57	59.38	17.82	20.13	.000*

Table (3) shows that there was statistically significant difference between studied children mean scores of oral health knowledge (pre/post implementation) (P<0.001) regarding importance of oral health, Benefits of using toothpasteBenefits of eating fruits and vegetables and drinking milk, most common diseases affecting oral cavity as well as reasons of tooth decay & bleeding gums respectively. It also reveals statistically significant improvement in children mean scores of oral health knowledge as regards, signs of dental caries, prevention of dental problems and definition of fluoride & dental floss respectively.

Figures 3, Total meanscore fororal hygiene correct knowledge among studied children and their teachers (pre/post) training program implementation



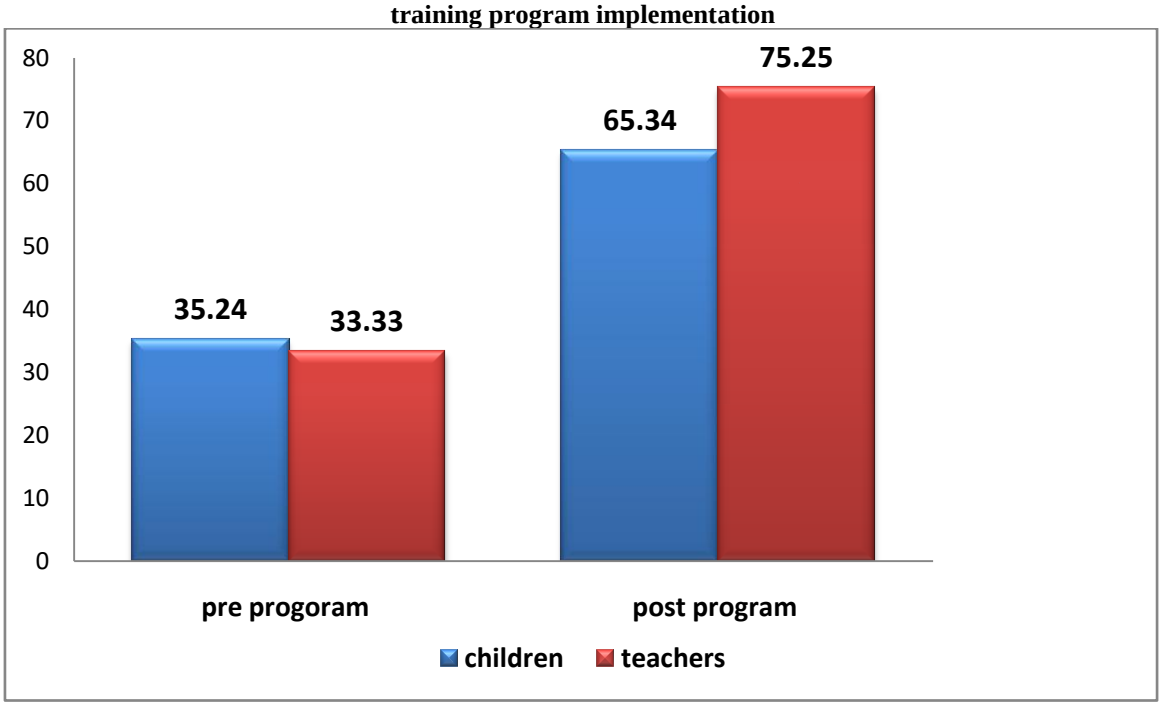
This figure shows that the improvement in the average values of the school teachers studied with regard to correct knowledge of oral hygiene after the implementation of the program, which led to improved level of knowledge of oral hygiene among children studied.

Table 4, Mean score difference of oral hygiene practices among studied children (pre/post) training program implementation.

Practice	HI children (n=68)				Mean Difference	T-Test	P-value
	pre		Post				
	Mean	SD	Mean	SD			
Time of tooth brushing	33.66	15.26	59.40	15.82	25.74	19.51	0.000*
Duration of tooth brushing (2minutes)	35.66	21.62	64.79	20.95	29.13	20.13	0.000*
Regularity of teeth brush	31.18	17.46	59.38	17.82	28.20	18.57	0.000*
visiting dentist	36.83	16.53	59.38	17.82	22.55	12.86	0.000*
Characteristic of brush teeth and toothpaste	34.52	24.30	69.24	18.14	34.72	20.19	0.000*
Clean your tongue	33.66	15.26	59.40	15.82	25.74	19.51	0.000*
Rinse your mouth after meals	35.66	21.62	64.79	20.95	29.13	20.13	0.000*

Table (3) shows that there is statistically significant difference between studied children mean scores of oral health practices (pre/post implementation) ($P<0.001$) regarding time of tooth brushing, duration of tooth brushing and visit dentist as well as characteristics of brush teeth &toothpaste . It also reveals statistically significant improvement in children mean scores of oral hygiene practice as regards, clean your tongue and rinse your mouth after meals.

Figures 4, Total mean scorefor oral hygiene practice among studied children and their teachers (pre/post) training program implementation



This figure shows that the improvement in the mean values of the school teachers studied with regard to practice of oral hygiene after the implementation of the training program, which led to improved level of knowledge of oral hygiene among children studied.

Figure5, Oral hygiene index score (OHI-S) among studied children (pre/post) program implementation (n=68)

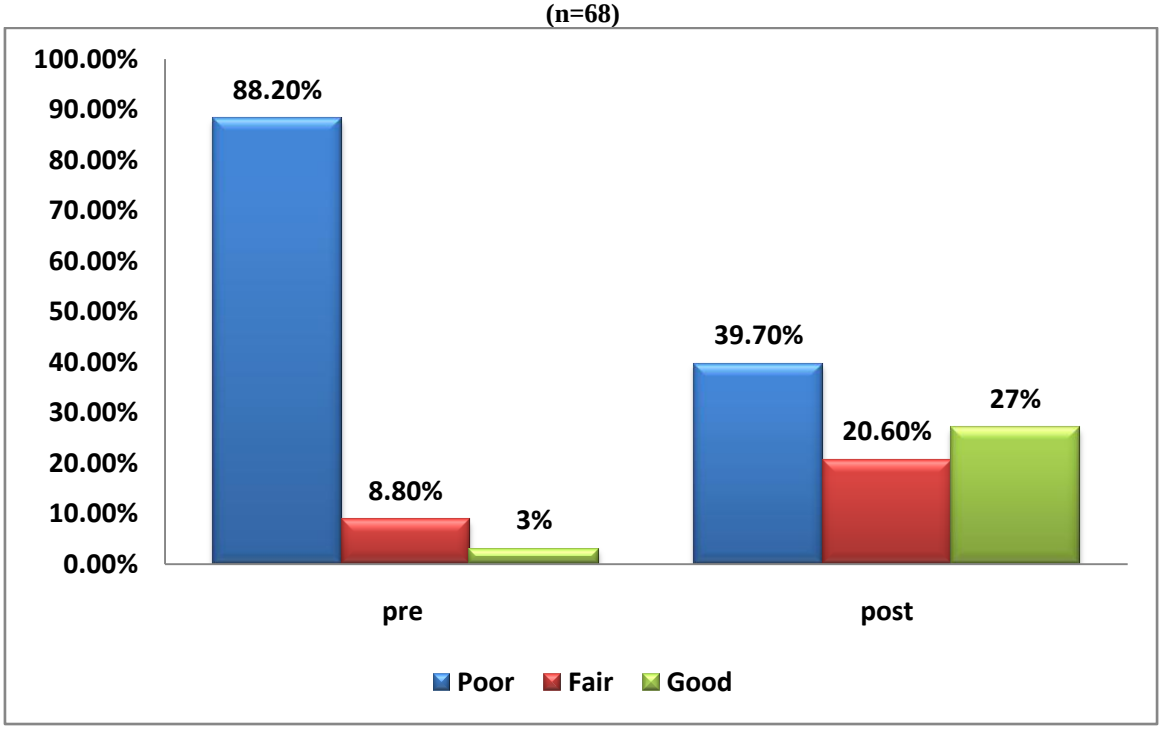


Figure shows that before the program, 88.2% of children had poor OHI-S score, 8.8% had fair OHI-s Score and 3% of them had good OHI-Score. After 3 months of training program 39.7%of children had poor OHI-S score, 20.6% had fair OHI-S score and 27% had good OHI-s score.

III. Discussion

Studies on oral health status of hearing-impaired people reported that they have poorer oral hygiene and low utilization of dental services[15]. A few studies were done on the oral health statement of hearing impaired children. [2, 16].

The study included 27 school teachers teaching for hearing impairment school children of Ismailia city; of which 44.4% were male and 55.6% were female teachers. The study included 68 aged from 6-12 years old and 33% of them are having severe hearing impairment level. Which was almost similar as in previous study ***wei et al,[17]*** who studied "Survey and analysis of dental caries in students at a deaf–mute high school" reported that The majority of HI children in this study were having severe (28.8%) to profound (61.0%) hearing impairment since children with mild hearing impairment were able to attend the ordinary class at main stream school.

The HI children had poor knowledge especially items on the causes of dental problems and periodontal disease, prevention of periodontal disease and role of oral hygiene which concurs with previous study done in Jiangsu province of East China by Wei et al. [17]that concluded normal children might have more advantages in term of comprehending oral health message delivered at school compared to HI children.

To overcome the communication problem in hearing-impaired children, school teachers of an interpreter was used to transfer the whole oral health education procedure.***Champion and Holt [2]*** who studied "Dental care for children and young people who have a hearing impairment"reported that the lack of communication among hearing-impaired children leads to inadequate health education when compared with general population.***Jain, S., et al[10]*** who studied "Effect of Training School Teachers on Oral Hygiene Status of 8-10 Years Old Government School Children of Udaipur City, India" reported that teachers instruction is any mix of learning encounters intended to encourage intentional activities helpful for well-being and which incorporate instructive health for children, young, folks, educators. The objective of oral health care training is to progress learning, which might prompt reception of positive oral well-being practices that add to better oral health.

In the study by ***pareek et la [18]*** who studied "Effectiveness of supervised oral health maintenance in hearing impaired and mute children parallel randomized controlled trial" found that Oral hygiene programs for hearing impairment through school teachers result in a marked improvement of oral hygiene and reduce the incidence and severity of gingivitis and periodontitis. It is also evident that the best means of establishing good oral hygiene among people with disabilities is not only through increased efforts and expertise of dental professionals, but also by giving systematic instructions to disabled subjects on self-care oral hygiene skills.

In the current study, an improvement among studied children regarding oral health knowledge was detected after implementation the program on school teachers. This was in accordance with ***Pertesen et al[19]***, who suited "Preschool teachers as agents of oral health promotion: an intervention study in Sri Lanka"reported also a significant increase in knowledge of oral hygiene post training.

The current study,after three months of implementation of training program there was statistically significant difference between studied children mean scores of oral health knowledge regarding importance of oral health, benefits of using toothpaste &benefits of eating fruits and vegetables and drinking milk, most common diseases affecting oral cavity as well as reasons of tooth decay & bleeding gums respectively. This was in agreement with **Dizon et al., [20]**who studied" Effectiveness of tooth brushing instruction through sign language on the oral hygiene performance of hearing impaired children" stated that school teachers knowledge level regarding oral health had significant influence on the oral hygiene level of their children.

At the beginning of present study, the overall oral hygiene practices of the study subjects was poor oral hygiene practices regarding time of tooth brushing, duration of tooth brushing and visit dentist as well as characteristics of brush teeth & toothpaste. After three months of implementation training program, there was statistically significant improvement in children mean scores of oral hygiene practice.***Rong et al.,[21]*** in conducted a similar type of study who studied" Effectiveness of an oral health education and caries prevention program in kindergartens in China" found that the baseline only 43% of the study subjects brushes once daily, six months post training there was significant increase up to 93.4%, participants who brush twice or more daily .

Another study by ***Stefanovska et al.,[22]*** who studied "Tooth-brushing intervention program among children with mental handicap" stated that the baseline to 36-week evaluation revealed highly significant increases in the number of participants brushing twice daily **.** ***Alse et al.,[4]*** who studied " Educational intervention on the plaque score among hearing impaired children" also found that most of their subjects (69.3) used to tooth brushing for cleaning of the teeth . Total 99.6% children after educational intervention understood the importance and need of teeth. Around 55% and 26% children after training came to know the correct number

of permanent and primary teeth post training.This was also in accordance with Fernando [19]who studied "Preschool teachers as agents of oral health promotion: an intervention study in Sri Lanka" who also concluded that the oral health knowledge score of teachers improved and oral health practice scores.

In the present study, statistically significant improvement in oral hygiene was observed when pre and post training OHI-S scores were compared. These findings were in partial accordance with ***Conrado et al[23]*** Who studied "A school-based oral health educationalprogram: the experience of Maringa- PR, Brazil" reported that there was a significant improvement in oral hygiene practice after education.***Maheshwari et al[24]***.Who studied "Effects of conventional vs game-based oral health education on children's oral health-related knowledge and oral hygiene status – a prospective study" also found significant increase in good scores oral hygiene practice and a significant decrease in debris scores on post oral health education.

In the study by***Chandrashekhar et al.,[25]*** also had similar findings when studied " Oral health promotion among rural school children through teachers: an interventional study Indian" found that pre-training poor OHI-S scores and post intervention scores were improved, suggesting the difference in OHI-S scores between different groups was statistically significant . ***Sri Wendarietal.[26]***, who studied "Effectiveness of primary school-based oral health education in West Java, Indonesia" and ***Chandrasekhar et. a[27]***. also carried out similar study when studied " The use of school teachers to promote oral hygiene in some secondary school students at Hyderabad, Andhra Pradesh, India: a short term prospective pilot study" found similar findings as the present study suggesting significant difference pre and post intervention OHI-s scores of children after educational training of teachers.

The present study also indicates a positive effect of oral hygiene education (OHE) program since in this study also most of the children adopted positive regular health behaviors such as tooth brushing, awareness and use of fluoride tooth pastes and they also came to know about the ill effects of sugary foods and hence have reduced their consumption. This positive effect was moderate and in association with other studies which have reported positive effects of OHE programs, such as mentioned by ***Gaubaet al.,[28]*** who studied "School based oral health promotionalintervention: Effect on knowledge, practices and clinical oral health related parameters" and ***Sri Wendari et al.,[26]*** that key components of educational intervention to seek positive behavior change were immediate gains from good oral hygiene, which is also key finding in the present study.

IV. Conclusion

The results of this study show that thechildren after the training provided by teachers improved their knowledge and practices towards oral health hygiene As well as. After three months of training program improved oral hygiene index among studied children.

V. Recommendation

- Implementation an oral health programs in schools of hearing impaired children decreases their suffering from oral problems.
- The involvement of parents and caregivers of hearing-impaired children in the oral health education program is strongly recommended.
- Tooth pastes and tooth brushes are needed to be available easily for the hearing impaired children either by governmental or nongovernmental organizations.

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