

## Impact of Oral Health Education Program on Knowledge and Practice of Mentally Challenged Children at Mainstream Primary Schools

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**Abstract:** Mentally challenged children are children with some sort of disability, who cannot fully make use of all their physical, mental and social abilities. The oral health of people with mental disabilities is often compromised, which has a harmful effect on their well-being and quality of life. Dental caries and periodontal disease are among the most common conditions affecting negatively children with mental disabilities. The primary goal of school health nurse is to provide education, training and support for those children and their family regarding oral hygiene, preventing dental discomfort and detecting oral disease early. The aim of this study was to evaluate the effect of oral health education program on knowledge and practice of mentally challenged children at mainstream primary schools. A quasi – experimental research design (pre/post test) was utilized in this study. Data were collected from three primary mainstream schools that were chosen randomly from three educational departments at Cairo Governorate. A purposive sample of 50 mentally challenged children, who met the inclusion criteria, were included in the study. Two tools were utilized in the current study, which were developed by the researchers. The first tool: Oral health structured interviewing questionnaire for mentally challenged children: consisted of 3 parts: Part I. Demographic data of the mentally challenged children Part II. Mentally challenged children' oral health habits experience (pre/ post test). Part III. Mentally challenged children' knowledge related to oral health (pre/post test). The second tool: Oral hygiene observational checklist for mentally challenged children, which was divided into 2 parts: Part I. included observation of mouth and oral cavity of mentally challenged Children and Part II included the steps of oral hygiene practice performed by mentally challenged children (pre/ post test). Results showed that there was a highly statistically significant difference between pre and post test scores regarding oral health habits and knowledge among mentally challenged children ( $P = > 0.00$ ). Also, it was found a significant difference between pre and post test in almost all steps of oral hygiene performed by mentally challenged children. Besides, it was detected a statistically significant correlation between total knowledge and total practice regarding oral hygiene before and after program implementation ( $P = > 0.00$ ). Conclusion, the study concluded that, the educational program about oral health care has a significant positive effect on improving knowledge and practices of mentally challenged children as there were significant difference between pre and post test in all variables. Recommendations, the study recommended performing periodic screening for mentally challenged students at mainstream schools to detect oral health problems, disseminating the oral health education programs for mentally challenged students to promote their oral health knowledge and practices.

**Key words:** Oral Health Education • Mentally Challenged Children • Educational program

### INTRODUCTION

Mentally challenged children are the children with a significantly reduced ability to understand new or complex information and to learn and apply new skills (impaired intelligence). This leads to reduced ability to cope independently (impaired social functioning).

It is also referred to as intellectual disability (ID), also known as general learning disability and mental retardation (MR). They are all considered as generalized neuro-developmental disorders characterized by significantly impaired intellectual and adaptive functioning. It is defined by an intelligence quotient (IQ) score under 70 in addition to lacking in two or more

adaptive behaviors that affect every day, general living. Once focused almost fully on cognition, the definition now includes both a component relating to mental functioning and one relating to individuals' functional skills in their environment [1-3].

American Psychiatric Association {APA} (1994) has defined a handicapped person as "One who over an appreciable period is prevented by physical or mental conditions from full participation in the normal activities of their age groups including those of a social, recreational, educational and vocational nature". The APA classifies retardation into four categories according to their intelligence quotient as mild, moderate, severe or profound retardation. An individual is classified as having mild mental retardation if his or her IQ score is 50-55 to about 70; moderate retardation, IQ 35-40 to 50; severe retardation, IQ 20-25 to 35; and profound retardation, IQ below 20-25 [4]. Mental retardation also had been defined as Sub average general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior [5].

Oral health is an integral part of general health and well-being. Good oral health enables individuals to communicate effectively, to eat and enjoy a variety of food, which is important in overall quality of life, self-esteem and social confidence [6]. The oral health of the disabled may be neglected because of the mental disability, a demanding disease or limited access to oral health care. Moreover, because of their level of function and their limited ability to undergo an oral examination, the mentally disabled present specific challenges when their oral health is assessed [7]. Oral health education program is a combination of learning experiences designed to facilitate voluntary actions which is a conducive to health. The oral health education program is important for increasing awareness of individuals, families or communities about oral health issues. Thus the scope of oral health education may include training interventions for mentally challenged children and their parents (or guardians) [8].

The prevalence of dental caries is estimated to be about 70% worldwide, periodontal disease is also one of the major dental diseases that affect people at highest prevalence rate [9]. Many studies have shown a higher prevalence of dental caries and periodontal diseases among mentally disabled population than their normal counterpart [10-13]. Educating and motivating mentally disabled children to carry out effective daily oral hygiene can be challenging but greatly rewarding when these efforts are successful. Children with mental disabilities

have difficulty in managing their oral hygiene because of lack of cognition to understand and remember what needs to be done. It was also reported that the oral hygiene of mentally challenged children is extremely poor and for this reason preventive procedures are very important. The possible mechanism to improve the oral condition of mentally challenged children is to conduct oral health programs and periodic monitoring of unmet treatment needs [14, 15].

Oral health problems are one of the most prevalent conditions in the world which are largely preventable. Prevention of Oral health problems especially among children with mental disabilities should be a primary goal of any community that aims to provide proper quality of the life for this population. The deficiency of organized dental health education programs at schools for disabled children and the lack of published literature that demonstrates the effectiveness of oral health education programs among mentally challenged or disabled children, all encourage health professionals especially school health nurses and school administrators to design and implement such programs [16-18]. School health nurses have an important role in promoting oral health among mentally disabled children through providing them (and their parents) with the proper knowledge and practices needed to promote their oral health. The school health nurses have a great role in educating mentally disabled children, offering training for them and their parents, teaching them about adequate nutrition, how to prevent dental problems and detecting oral disease early. Also, they have the responsibility to design and implement oral health education programs for mentally challenged children at mainstream schools after doing careful assessment to their condition [19]. So, the aim of the present study was to evaluate the effect of oral health education program on knowledge and practice of mentally challenged children at mainstream primary schools.

## MATERIALS AND METHODS

**Aim of the Study:** The aim of the present study was to evaluate the effect of oral health education program on knowledge and practice of mentally challenged children at mainstream primary schools.

**Research Hypotheses:** To fulfill the aim of this study, the following research hypotheses were formulated:

*H1:* Mentally challenged children who received oral health education program will have higher knowledge scores after the program implementation.

*H2*: Mentally challenged children who received oral health education program will have higher practice scores after the program implementation.

**Research Design:** A quasi – experimental research design (One group pre/post test) was utilized in this study. This design is used by researchers when only one group is available for study [20]. Data was collected two times, before and one month after implementation of the program.

**Setting of the Study:** This study was conducted in governmental primary mainstream schools at Cairo Governorate. There were thirty two educational departments at Cairo Governorate. Ten percent of these educational departments (which were three educational departments) were selected randomly. One school from each educational department was selected randomly. These educational departments and their affiliated schools were as follow: El-Maadi educational department (El-Khobery primary school), El-Sahel educational department (Hadaek Shobra school) and Ain-Shams educational department (Mohamed Abdou school). Mainstream schools refer to schools that admit children with different types of disabilities together with normal children in the same class. These mentally challenged students' IQ level ranges between 55-70. They are able to do the same work and duties of normal students with the presence of special education services.

**Sample of the Study:** A purposive sample of 50 mentally challenged students from the three selected primary mainstream schools, representing the selected educational departments, who met the inclusion criteria, were included in the study.

**Inclusion Criteria:**

- Students with mild mental retardation (IQ level 55-70), enrolled in primary mainstream schools, able to communicate and agree to participate in the study.

**Tools for Data Collection:** Two tools were utilized in this study. These tools were developed by the researchers based on WHO Survey [21] and Azodo and Umoh [22]

**The First Tool:** Oral health structured interviewing questionnaire for mentally challenged children:

This tool is divided into 3 parts:

**Part 1:** This part assessed demographic data of the mentally challenged children. It included questions about: sex, age, grade, number of siblings, child rank, presence of chronic illness, available dental & oral health care services and previous health education about oral health.

**Part 2:** This part assessed mentally challenged children's oral health habits (pre/ post test), consisted of 10 questions about: materials used for cleaning teeth, availability of tooth brush, frequency of teeth brushing, frequency of rinsing mouth after each meal, time & method of tooth brushing, frequency of changing tooth brush, frequency of dental visit, importance of dentist visit and place of dental health follow-up.

**Part 3:** This part assessed mentally challenged children' knowledge related to oral health (pre/post test), consisted of 10 questions about meaning, importance, benefits of oral health, effect of poor teeth cleaning, eating a lot of sweets, drinking a lot of carbonated drinks, risk factors of oral disease, basic components of balanced diet, prevention of decay, sources of knowledge about oral health, barriers to perform proper oral health care. If the answer was correct it worth score (1) and if the answer was incorrect it worth score (0). Students who scored between 1 and 3 were considered having poor knowledge, while who scored between 4 and 6 were considered having fair knowledge and those who scored between 7 and 10 were considered having good knowledge.

**The Second Tool:** Observational checklist for mentally challenged children:

- The aim of this tool was to assess practices of mentally challenged students regarding oral health care. This tool was divided into 2 parts:

**Part 1:** This part included observation of mouth and oral cavity of mentally challenged children to assess its cleanliness in order to detect presence of plaque, decayed teeth, missed teeth and broken teeth. This part was applied pre program.

**Part 2:** This part included the steps of oral hygiene practice performed by mentally challenged children (pre/ post test), 9 steps were included that indicated

correct performance of oral care. The students who performed each step correctly was considered as 'done', while those who did not, was considered as 'not done'.

**Pilot Study:** A total of 10% of the students were included in the pilot study in order to assess the feasibility and clarity of the tools and to determine the needed time to answer the questions. On the basis of its result minor changes were done to the tools. So, students who participated in the pilot were included in the study.

**Ethical Considerations:** An official permission was obtained from Central Agency for Public Mobilization and Statistics (CAPMAS), Ministry of Education, Cairo Educational Directorate and from three Educational Departments "Ain-Shams", "El-Sahel" and "El-Maadi". Also permission was taken orally from the directors of all primary mainstream schools that are affiliated to these departments. Written informed consent was obtained from the parents of the students. Oral consent then was obtained from the students to participate in the study. The researchers informed the parents of students about the purpose and nature of the study and emphasized that participation in this study is entirely voluntary; each subject had the right to withdraw at any time. Anonymity and confidentiality were assured.

**Statistical Analysis:** The collected data were coded, scored, tabulated and analyzed using Statistical Package for the Social Sciences (SPSS) version 21. It included the test of significance given in standard statistical books. Collected data were summarized and tabulated using descriptive statistics. Frequency and percentage were used for numerical data, as well as mean and standard deviation. For analysis of non-quantitative data, the  $\chi^2$ -test was used. In addition, correlation coefficient was used to describe association between variables in the same group. P-value less than 0.05 were considered significant and less than 0.001 considered as highly significant. Comparison between pretest and posttest was done by using t-test and ANOVA test.

## RESULTS

The Study Results Will Include the Following:

- Demographic characteristics of mentally challenged students (Table 1), mentally challenged children's oral health habits (Table 2), mentally challenged children knowledge related to oral health

(Tables 3-4), oral hygienic practice of mentally challenged children (Tables 5-7) and the relation between study variables (Table 8-9).

### Demographic Characteristics of Mentally Challenged Children:

Table (1) showed that, 46% of the children aged from 11> 12 years (with mean age  $10.65 \pm 1.63$  years). Also, it was shown that more than half (52%) of students were females and 60% of them had from 2-3 siblings. Concerning the type of health care services, 38% of students indicated that they go to private hospitals/clinics for seeking medical care. Regarding source of information, 54% of students had got information about oral health care from relatives. As regard barriers to go to dentist, nearly two thirds of the sample (62%) mentioned that they are afraid of investigations.

Table 1: Demographic characteristics of mentally challenged children (n= 50)

Variables	Frequency	%
Age /year:		
10- >11	7	14
11 >12	23	46
12 - 13	20	40
Age (mean $\pm$ SD):	10.65 $\pm$ 1.63	
Sex		
Male	24	48
Female	26	52
Number of siblings:		
0-1	7	14
2-3	30	60
4-5	13	26
Child rank:		
1 <sup>st</sup>	15	30
2 <sup>nd</sup>	18	36
3 <sup>rd</sup>	10	20
4 <sup>th</sup>	5	10
5 <sup>th</sup>	2	4
Type of health care services:		
Governmental	15	30
Health insurance	15	30
Private	19	38
Nothing	1	2
Source of information:		
Radio, T.V	12	24
Medical team	9	18
Relatives	27	54
Newspapers, magazines	2	4
Barriers to do dentist visit:		
Lack of money	7	14
High cost	8	16
Fear of investigation	31	62
Fear of doctor	4	8

Table 2: Distribution of mentally challenged children according to their oral health habits before and after program implementation (n= 50).

Oral health care habits	Choices	Before		After		t-test	P
		No.	%	No.	%		
**Method of cleaning teeth	Brush and paste only	38	76	41	82	3.02	*0.002
	Only thread	8	16	6	12		
	Brush, paste and thread	1	2	5	10		
	Swak	2	4	4	8		
	With water	1	2	5	10		
Having toothbrush	No	46	92	5	10	1.04	*0.003
	Yes	4	8	45	90		
Frequency of cleaning teeth	Once daily	30	60	40	80	2.32	*0.002
	Twice daily	10	20	5	10		
	More than twice daily	7	14	4	8		
	Never	3	6	1	2		
**Time of washing teeth	Morning	13	26	45	90	2.54	*0.001
	After eating	5	10	40	80		
	Before bedtime	4	8	10	20		
	Morning and evening	11	22	37	74		
	Never		6	1	2		
**The way of washing teeth	Horizontal movement	20	40	40	80	3.76	*0.002
	Vertical motion	10	20	45	90		
	Circular motion	9	18	20	40		
	Do not know	5	10	2	4		
Frequency of changing tooth brush	Every 3 months	3	6	20	40	2.89	*0.004
	Every 6 months	21	42	22	44		
	Every year	19	38	6	12		
	Never	7	14	2	4		
Frequency of visiting dentist	Regularly every 6 months	2	4	12	24	3.67	*0.005
	Once a year	18	26	11	22		
	When I have a problem	20	40	22	44		
	Never	10	20	5	10		
**The importance of visiting dentist	Provide appropriate treatment	26	52	45	90	2.45	*0.04
	Prevent complications	14	28	40	80		
	Early detection of diseases	11	22	20	40		

\*\*Responses are not mutually exclusive

Table 3: Distribution of mentally challenged children's knowledge related to oral health before and after program implementation (n= 50)

Knowledge Variables	Before		After		T-test	P
	Correct answers		Correct answers			
	No.	%	No.	%		
-Meaning of oral health	14	28	50	100	2.12	0.00*
-Importance of dental hygiene	10	20	45	90	2.14	0.05*
-The benefits of mouth care	10	20	44	88	2.12	0.00*
-Causes of tooth decay	12	24	50	100	3.14	0.00*
-Types of food that lead to tooth decay	15	30	46	92	2.23	0.03*
-Types of forbidden drinks	12	24	45	90	3.43	0.02*
-Consequences of tooth decay	7	14	42	84	2.02	0.00*
-Risk factors for toothache and tooth decay	10	20	40	80	3.15	0.01*
-Essential elements of healthy diet	11	22	45	90	3.03	0.01*
-Methods of oral care	15	30	50	100	2.14	0.05*

\* The mean difference is significant at the 0.05 level.

Table 4: Total knowledge score of mentally challenged children regarding oral health, before and after implementation of the program (N = 50)

Total Knowledge	Before program	After program	Statistical significance	
			T-Test	P- value
Poor	21 (42%)	5 (10%)	4.096	0.000*
Fair	25 (50%)	30 (60%)		
Good	4 (8%)	15(30%)		

Table 5: Observation of mentally challenged children's oral cavity (n= 50)

Observation of oral cavity	Yes		No	
	No.	%	No.	%
-Presence of plaque	20	40	30	60
-Dental caries	24	48	26	52
-Broken teeth	10	20	40	80
-Missing teeth	8	16	42	84
-Oral inflammation	12	24	38	76

Table 6: Distribution of steps of oral hygienic practice as performed by mentally challenged children before and after implementation of the program (n= 50)

Steps of oral hygiene practice	Before program [n (%)]		After program [n (%)]	
	Done	Not done	Done	Not done
-Moisten the brush with water.	45 (90)	5 (10)	48 (96)	2 (4)
-Put toothpaste on brush.	37 (74)	13 (26)	43 (86)	7 (14)
-Apply the brush at the beginning of the teeth.	25 (50)	25 (50)	37 (74)	13 (26)
-Hold the brush vertically and use gentle motions up and down to clean the front teeth.	24 (48)	26 (52)	40 (80)	10 (20)
-Clean the inner teeth gently using up and down motions.	20 (40)	30 (60)	33(66)	17 (34)
-Brush oral cavity.	24 (48)	26 (52)	35 (70)	15 (30)
-Clean the tongue to remove the remaining bacteria.	10 (20)	40 (80)	29 (58)	21 (42)
-Rinse mouth and spit.	26 (52)	24 (48)	45 (90)	5 (10)
-Clean the brush thoroughly, wash and dry it.	27 (54)	23 (46)	40 (80)	10 (20)
-Performing all the steps	12 (24)	38(76)	29 (58)	21 (42)

Table 7: Total oral hygiene practices as performed by mentally challenged children before and after implementation of the program (n= 50)

Total Practice	Before program	After program	Statistical significance	
			T- Test	P- value
Done	11 (22%)	29 (58%)	3.695	0.000*
Not done	39 (78%)	21 (42%)		

Table 8: The correlation between total knowledge and total practice scores regarding oral hygiene among mentally challenged children

Variables	Total knowledge		Total practice	
	Correlation coefficient	p-value	Correlation coefficient	p-value
Total knowledge			0.32	0.001*
Total practice	0.32	0.001*		

\* The mean difference is significant at the 0.05 level.

Table 9: Correlation between age and sex of students with their total knowledge and practice before and after implementation of the program

Variables	Age				Sex			
	Before		After		Before		After	
	r	p	r	p	r	p	r	p
Total knowledge	0.01	0.83	0.15	0.130	0.25	0.01*	0.38	0.01*
Total practice	0.18	0.06	0.06	0.68	0.31	0.02*	0.33	0.01*

### **Mentally Challenged Children's Oral Health Habits:**

Table (2) revealed that there is a significant improvement in children's oral health care habits before and after program implementation.

### **Mentally Challenged Children's Knowledge Related to Oral Health:**

Table (3) shows that, there were significant improvement in students' knowledge regarding oral hygienic care before and after implementation of the program, as manifested by the improvement in percentage of correct answers of students in all knowledge variables.

Table (4) declares that there was a significant improvement in students' knowledge regarding oral health before and after program implementation ( $p=0.000$ ). This table supported the first hypothesis.

### **Oral Hygiene Practice of Mentally Challenged Children:**

Regarding mentally challenged children's observation of oral cavity, Table (5) revealed that 48% of students had got dental caries, while 24% of them had oral inflammation as a result of their poor hygienic practice.

As regard the steps of the oral hygiene practices, Table (6) revealed that there was a significant improvement in mentally challenged students' practices regarding the steps of oral hygiene, before and after program implementation. Also, the percent of students who performed all the steps of oral hygiene correctly had increased from 24% (before program) to 58% (after program).

Table (7) illustrates that there was a significant improvement in students' oral hygienic practices before and after program implementation ( $p=0.000$ ). This table supported the second hypothesis.

### **The Relation Between Study Variables:**

Table (8) reveals that there was a statistically significant correlation between total knowledge scores and total practice scores of mentally challenged children with  $p\text{-value} = 0.001$ . This means with the increase in knowledge level of students, there was an increase in their practice level regarding oral hygiene.

Table (9) shows that there was a statistically significant correlation between sex of students and their total knowledge and practice before and after implementation of oral health program, while there were no significant relation between age of students and their knowledge and practice regarding oral hygiene.

## **DISCUSSION**

Mentally challenged children are perhaps the largest underserved population globally experiencing injustice in health access and outcomes [19]. Researchers have indicated that oral hygiene levels are poor in people with disabilities, this may be due to that teaching students to manage their disability is of major concern among school health nurses and oral hygiene is of less priority and thus they are in great need to oral health education. School health nurses are in a key position to conduct such programs, as schools are thought to be the most suitable environment to provide health information to those children. Dental health education programs in schools are thus accepted and resulted in improvements in oral hygiene among children with disabilities over the past few decades [23-25].

The results of the current study revealed that nearly half of children aged from 11 > 12 years with mean age  $10.65 \pm 1.63$  years. Also, it was shown that more than half of students were females. This result is in agreement with the result of a study done by Pratap *et al.* [10] who performed their study with the aim to outline oral health status among intellectually disabled population. It was found that the majority of disabled school aged students, from 6-13 years, lack education about oral health. Another study done by Purohita and Singhb [26] which was conducted to compare and assess oral health status of 12-years-old children with disabilities with healthy control group in Karnataka, Southern India. The sample consisted of 191 school children with disabilities, compared to 203 healthy children who were randomly selected from other governmental schools. It was found that 12-years-old school children are most age in need for oral health education and both gender was almost equally affected. These results ensure the importance of conducting such an oral health education to this age group of mentally challenged students.

The results of the present study also found a significant improvement in children's oral health care habits and their knowledge regarding oral hygienic care, before and after program implementation.. In the same line, a study done by Relwani *et al.* [1], in India, to compare and evaluate the effect of dental health education through schoolteachers and dental health professionals on 71 students in the age group of 6-15 years attending special education school. It was indicated that there were a significant improvement in students' knowledge about

dental health and improved oral hygiene habits status. Also, it was revealed that school nurses are the most competent and useful personnel in providing dental health education to the schoolchildren. Also, a study carried out by Ebrahim *et al.* [27], with the aim to investigate the effect of an educational intervention program on oral health knowledge and practice among primary school pupils in Tanta city. It was indicated that there were statistically significant improvements in the pupils' total scores of knowledge and practice of oral health care immediately and three months after implementation of the program and the educational program was effective in enhancement of pupils' knowledge and practice of oral health care.

Regarding the observation to oral hygiene of students, the study results revealed that 48% of students had got dental caries, while 24% of them had oral inflammation which indicates poor hygienic practice by students. A study done by Kothari *et al.* [25] to assess the impact of various socio demographic factors on oral hygiene of 267 mentally retarded subjects enrolled at various institutions of Bhopal city in India. It was found that the majority of female subjects were having mild type of mental retardation, while male subjects had poorer oral hygiene than their female counterparts. Also, it was indicated that 74.5% of subjects complain of oral inflammation, more than half (54.7%) of them had got plaque and 40% had dental caries.

Another study was done by Pagaria *et al.* [19] to assess oral health status of 70 mentally challenged children and adolescents attending special school in Durg and Bhilai city (India) between the age 7 and 18 years. It was revealed that the overall oral hygiene status of the study population was fair with a prevalence rate of 30.0, 38.6 and 31.4% for good, fair and poor levels respectively. In the same line, a study conducted by Kumar *et al.* [7] had observed good, fair and poor levels of oral hygiene with a prevalence rate of 4.7, 32.7 and 62.6% respectively. Another study by Jain *et al.* [24] had showed that 23, 37 and 40% of the subjects had good, fair and poor oral hygiene status. This similarity in results explains the importance of educating mentally challenged children how to take care of their oral hygiene.

The study results also revealed a significant improvement in mentally challenged students' practices regarding the steps of oral hygiene, as well as improvement in their oral hygienic practices before and after program implementation ( $p=0.000$ ). These results are in agreement with an Egyptian study done by Seif El-Nasr [28], with the aim of evaluating the effect of an oral

health intervention program among primary school children. It was found that before oral health intervention program, more than a quarter of students performed all steps of brushing teeth, which increased to more than half after program implementation. Similar results are found in a study carried out by Abu-Elenen *et al.* [29], to evaluate the effect of an oral care educational program on the knowledge, practice and self-efficacy among school-aged children and revealed that, 21.2% of students performed the recommended practice of brushing teeth twice daily, but after program the percentage improved to 27.6 and 32.5% immediately and at follow-up, respectively.

The results of the current study revealed a highly statistically significant correlation between the study participant's total knowledge and practice before and after program implementation. The same results is found by Haque *et al.* [18], who assessed the effectiveness of a school based oral health intervention program on: 1) increasing oral health knowledge, attitude and practices and 2) decreasing the prevalence of untreated dental caries among 944 students from three local schools, at grades 6-8 in Bangladesh and found a significant improvement in almost all indicators of knowledge variables before and after the program implementation with  $P<0.001$ . In addition, oral health education intervention was found to be significantly associated with higher level of practices toward oral health and all steps of performing oral hygiene. The change to healthy practice was occurred by giving adequate information, motivation to healthy practices.

The results of the present study also indicated that there was a statistically significant correlation between sex of students and their total knowledge and practice before and after implementation of oral health program. While, there were no significant relations between age of students and their knowledge and practice regarding oral hygiene. Same results were found in a study done by Chandrasekaran and Dhanraj [5], with the aim of assessing the oral hygiene status of mentally challenged adolescents in Chennai. It was declared that some variables usually influence oral hygiene practices among the mentally retarded children as: the age, gender, intensity of MR, socioeconomic status and their knowledge about oral health.

Another Egyptian study done by Seif El-Nasr [28] who reported that there were no statistically significant differences between age, sex and place of residence of students with total knowledge and practice before and after oral health intervention program.



## CONCLUSIONS

Based on the results of the current study, it is concluded that, oral health education program had a positive effect on mentally challenged children's knowledge and practices toward oral health. Also, results revealed a statistically significant correlation between total knowledge and practice of mentally challenged children regarding oral health before and after program implementation.

**Recommendations:** The following recommendations are suggested:

- Designing and implementing oral health education programs for mentally challenged students at mainstream schools regularly by school health nurses to promote students' oral health knowledge and practices.
- Periodical screening should be implemented for school students by school health nurses for early detection of oral inflammation and dental decay and making referral to the related health insurance services.
- Developing attractive colored educational booklets about oral health care by school health nurses and distributing them to students with special needs.
- Future studies should be conducted on large sample of mentally challenged students and at different settings for generalization of result.

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