

Original Article

## Evaluation of the Effectiveness of Hand Hygiene Training Given to the Hearing-Impaired Children

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### Abstract

**Background:** It is a fact that learning processes of the children with hearing impairment are more difficult and require more effort compared to their healthy peers.

**Aims:** This study was carried out to determine the effect of hand washing training given to the primary and secondary school students with hearing impairment on their hand washing attitudes.

**Methodology:** The study was semi-experimental and had a pre test-post test layout with single group. It was carried out with 16 students attending Uzun Mehmet Hearing Impaired School affiliated to Zonguldak Provincial Directorate of National Education between 3rd March, 2017 and 31st May, 2017. Data in this study were collected by using Student Information Form and Hand Washing Skills Assessment List.

**Results:** Mean age of the children was  $13,05 \pm 5,04$  (12-16) years old, 43,8% (n = 7) were males, 56,2% (n=9) were females, and 100% (n = 16) were hearing-impaired.

When looking at the results of the findings related to hand hygiene of the hearing-impaired children, it was determined that 56,2% (n=9) had a training for hand hygiene previously, 43.8% (n=7) did not have any training about hand hygiene and 100% had no health problems with their hands. Hearing-impaired children were given a training called "Hand Hygiene" to enhance their hand hygiene attitudes and it was found out that there was a statistically significant difference between total score averages in pre treatment (pre test) and second measurement just after the training (post test) ( $p=0.000$ ).

**Conclusions:** It was concluded that the training which was given to the hearing-impaired children was effective in their development of proper hand washing skills. It is thought that the presence of child health nurse in the schools of hearing-impaired children will contribute to the acquisition of healthy living attitudes and the development of hand hygiene skills and habits.

**Key Words:** Hand washing, Hand hygiene, Training, Hearing-impaired.

## Background

From the moment of birth, people acquire plenty of knowledge through hearing. It is known that even the children without any kinds of disability or health disorder have many problems during the period of growth, development and socialisation and they are badly influenced from these problems (Akkok, 1991; Beyazova, 1991). Disabled person is an individual who cannot benefit from normal living opportunities due to his/her health condition. Therefore, the presence of a person's hearing impairment leads to specific problems (Metin, 1996).

The number of hearing-impaired individuals has an increase in countries with poor health services (Sahin, 2004). The socio-economic and cultural conditions of our country cannot provide a sufficient infrastructure for the services to be taken to the disabled individuals. According to Turkish Statistical Institute's 2010 health research, the rate of people in Turkey who live using a hearing aid is composed of 3,7% of the whole population.

The rate of those who cannot use a hearing aid is 0,1%. These rates indicate that approximately 3 million people have hearing impairment and these rates are expected to increase rapidly in the following years due to the economic and life conditions. In developed countries, the rate of hearing aid usage is known to be around 10% (TUİK, 2011).

All behaviours occur as a result of learning. It is a fact that learning processes of the children with hearing impairment are more difficult and require more effort compared to their healthy peers. That is why children with disabilities gain life experiences that result in adaptation problems at every stage of their lives (Ozsoy, Ozyurek and Eripek, 2001).

Hearing disability is a problem that is closely related to society. Some occupational groups have specific tasks about identifying, monitoring, supporting care, being educated socially and psychologically, being integrated into society of the hearing impaired child. The services to be provided to these children often require a team work. Within the groups providing these assistance services, there are doctors, nurses, psychologists, social care specialists, school counselors, teachers and directors (Oztek and Kubilay, 1993; Birol, 2000).

The purpose of this study in accordance with this information is to review the personal hand hygiene knowledge of hearing-impaired children and to determine the change in the behaviour by providing the necessary training.

## Methodology

**Objective and Type of the Study:** When the literature is reviewed, hearing-impaired individuals especially have speech problems and applications related to speech. But the studies on the health status of hearing-impaired children focus on oral hygiene status of these children. Our objective in this study, which is not seen in literature, is to determine personal hand hygiene habits of the hearing-impaired children and the change in the behaviour after training given. The research was planned in a descriptive- cross sectional manner.

**Setting and Characteristics of the Study:** The study was carried out in a state school called Uzun Mehmet Hearing-Impaired School in Zonguldak between March and May, 2017. It is thought to represent the universe of the study since there is only a hearing-impaired primary school in Zonguldak province central district. Therefore, the universe is studied without sample selection in this study. There are twenty students in total at school and 16 students filling in consent forms were included in the study. The implementation of the study was carried out in consultation with school heads and in accordance with the students' course schedules at previously set time.

**Data Collection Tools:** In accordance with expert opinions and literature, hand hygiene behaviour determination form prepared to determine the change in behaviour that occurred after hand hygiene training was given to the hearing-impaired children and personal information form was used for data collection.

**Implementation of the Study:** The implementation of the study was carried out between 15th March and 31st May, 2017 by making a program with the school director on convenient dates of the school and obtaining consent forms from the families of the students. Researchers don't have the education of sign language. During the implementation, the hours that teachers were suitable most were selected. Verbal and visual education given by the researcher was transferred to the hearing-impaired students by their teachers using sign

language. It was determined to be 15th May 2017 as the first available date after negotiations. The students were given a pre-test about hand hygiene behaviors before training. After the pre-test was applied, students were randomly divided into four groups regardless of male or female in the scope of school toilet conditions. The students in the first group were asked to wash their hands and they were observed during that time. Then, the students in all groups were told to wash their hands with only water and soap with the help of mechanical movements after all the contaminated and dirty routine procedures in life requiring hand contact. Social hand washing training, which is defined as the removal of the majority of temporary microorganisms and should last at least 15-20 seconds, was given both verbally and visually and then they were shown practically. The content of the training is as follows:

- First of all, hands are made wet with water.
- 3-5 ml liquid soap is taken into hands. (The students were shown to press the soap box 3-5 times in order to get soap.) (Washing hands with a solid soap was also practised for their home atmosphere.)
- Soap is contacted with the palms of hands and foamed.
- The backs of hands are cleaned.
- Finger hollows and back of fingers are cleaned.
- Thumbs are cleaned.
- Fingertips and nails are cleaned thoroughly.
- Hands are rinsed rigorously and dried with the help of paper towels.
- The faucet is closed with the used-paper towel and it is thrown into the trash.

In order to gain an effective social hand washing, it was concluded that each processing step was needed to be repeated at least 5 times. After the training given by the researcher, the students themselves were asked to perform hand washing procedures. The performance of each student lasted about a minute. The same procedures were applied to the other groups and each group, including the duration of training, took an average of 10 minutes when considering their disabilities. Due to the training environment, a 5-minute break was

given between each group. In the scope of displacements, training environment and conditions, the total training period of four groups lasted nearly 1 hour.

**Analysis of Data:** SPSS 16.0 package program was used for statistical analysis. The suitability of numerical variables to normal distribution was examined by Shapiro-Wilk test. In descriptive statistics, mean $\pm$ standard deviation (range) (minimum-maximum) values were used for numerical data, frequencies and percentages for categorical variables. Wilcoxon test was used for comparison of two groups regarding numerical variables. Results were assessed in with 95% confidence interval (CI) and  $p < 0.05$  was considered to be statistically significant.

**Ethical Aspect of the Study:** Ethics committee approval for the study was obtained from Zonguldak Bulent Ecevit University (BEU) Human Research Ethics Committee. The institutional authorizations were also taken from Zonguldak Uzun Mehmet Hearing Impaired Primary School affiliated with Zonguldak Directorate of National Education. The mothers of the students involved in the study were made to fill in the consents forms.

## Results

The mean score of the children was composed of  $13.05 \pm 5.04$  (12 -16), 43.8% (n = 7) male, 56.2% (n = 9) female. When sociodemographic characteristics of the hearing-impaired children's parents were examined, 43.8% (n=7) of the mothers were illiterate while 56.2% (n = 9) of the fathers were primary school graduates. 68.8% of the children indicated that they lived with their mother, father and grandparents and had 1-3 siblings. When home characteristics of the hearing-impaired children were examined, all of them had running water at their homes, a bathroom and toilet, a toilet sink and a toilet sink in the toilet itself, a sink in the kitchen, 93.8% of them had a sink in the bathroom, and had a water system of tap water at their homes. All of the hearing-impaired children were determined to have a toilet, a sink and soap at their school. When characteristics of the hearing-impaired children's hand hygiene were examined, 56.2% (n=9) of them had received training on hand hygiene before whereas 43.8% (n=7) of them had not had any training on hand hygiene and none of them had any health problems with their hands. The hearing-impaired children were given 'Hand Hygiene' training in order to develop their

hand hygiene behaviours and a statistically significant difference was found in total mean scores between pre-test (before training, first measurement) and post-test (after training, second measurement). (p=0.000) (Table 6).

**Table 1. Sociodemographic Characteristics of the Hearing-Impaired Children**

<b>Characterisrics</b>	<b>n</b>	<b>%</b>
<b>Age</b>		
12	2	12.5
13	5	31,2
14	5	31.2
15	3	18.8
16	1	6.2
<b>Sex</b>		
Male	7	43.8
Female	9	56.2
<b>Total</b>	<b>16</b>	<b>100.0</b>

**Table 2. Sociodemographic Characteristics of the Hearing-Impaired Children’s Parents**

<b>Characteristics</b>	<b>n</b>	<b>%</b>
<b>Education of Father</b>		
Literate	2	12.5
Primary School Graduate	9	56.2
Secondary School Graduate	5	31.2
<b>Education of Mother</b>		
Illiterate	7	43.8
Literate	4	25.0
Primary School Graduate	4	25.0
Secondary School Graduate	1	6.2
<b>Family Members</b>		
Mother, father, children	5	31,2
Mother, father, children and grandparents	11	68.8
<b>Number of siblings</b>		
1-3	11	68.8
3-5	4	25.0
5-7	1	6.2
<b>Total</b>	<b>16</b>	<b>100.0</b>

**Table 3. Home Characteristics of Hearing-Impaired Children**

<b>Characteristics</b>	<b>n</b>	<b>%</b>
<b>Do you have running water?</b>		
Yes	16	100.0
No	0	0.0
<b>Do you have a bathroom?</b>		
Yes	16	100.0
No	0	0.0
<b>Do you have a toilet?</b>		
Yes	16	100.0
No	0	0.0
<b>Are the bathroom and the toilet apart from each other?</b>		
Yes	12	75.0
No	4	25.0
<b>Do you have a sink in the bathroom?</b>		
Yes	15	93.8
No	1	6.2
<b>Do you have a toilet sink?</b>		
Yes	16	100.0
No	0	0.0
<b>Is the sink in the toilet itself?</b>		
Yes	16	100.0
No	0	0.0
<b>Is there any soap on the toilet sink?</b>		
Yes	15	93.8
No	1	6.2
<b>Do you have a sink in the kitchen?</b>		
Yes	16	100.0
No	0	0.0
<b>Do you have a tap in the garden?</b>		
Yes	11	68.8
No	5	31.2
<b>Is water system of your house tap water?</b>		
Yes	15	93.8
No	1	6.2
<b>Is water system of your house conveying water system?</b>		
Yes	5	31.2
No	11	68.8
<b>Total</b>	<b>16</b>	<b>100.0</b>

**Table 4. School Characteristics of Hearing-Impaired Children**

Characteristics	n	%
<b>Do you have running water at school?</b>		
Yes	16	100.0
No	0	0.0
<b>Do you have a toilet at school?</b>		
Yes	16	100.0
No	0	0.0
<b>Is the toilet inside the school?</b>		
Yes	16	100.0
No	0	0.0
<b>Is there a sink in the toilet?</b>		
Yes	16	100.0
No	0	0.0
<b>Is there any soap on the sink in the toilet?</b>		
Yes	16	100.0
No	0	0.0
<b>Total</b>	<b>16</b>	<b>100.0</b>

**Table 5. Characteristics of the Hearing-Impaired Children's Hand Hygiene**

Characteristics	n	%
<b>Have you ever received any training on hand hygiene?</b>		
Yes	9	56.2
No	7	43.8
<b>Do you have any health problems on your hands?</b>		
Yes		
No	0	0.0
	16	100.0
<b>Total</b>	<b>16</b>	<b>100.0</b>

**Table 6. Comparison of Mean Scores of the Hearing-Impaired Children's 'Identification Form of Hand Hygiene Behaviours'**

Identification Form of Hand Hygiene Behaviours Minimum-Maksimum Scores	First Measurement $\bar{x} \pm SD$ (Min-Max)	Second Measurement $\bar{x} \pm SD$ (Min-Max)	Z*	p
Hand Hygiene Behaviour	29.50 $\pm$ 5.71 (19-37)	50.62 $\pm$ 6.94 (33-60)	-3.517	<b>0.000</b>

\* Wilcoxon test

## Discussion

Hearing is one of the basic senses that relates to life itself, and takes part in individual's intellectual and language development (Genc, Erturk and Belgin, 2005). Sense of hearing plays a significant role on children's cognitive and motor development, communicative and behavioral skills, educational field, and relationship with other people (Sunal and Cam, 2005; Keilman, Limberger and Mann, 2007).

Hearing disability is defined as a situation that occurs when an individual's hearing sensitivity fails to fulfill his/her duties in social progress and cohesion especially communication. It is a type of disability that affects child's development, communication, socialization, and thus his/her whole life (Bulut, 2003; Sunal and Cam, 2005; Konuk, 2006). Although hearing disability is one of the common congenital disorders, it is difficult to be recognized (Genc, Erturk ve Belgin, 2005). Studies have shown that the frequency of hearing disability among children is 1-6 per 1000 births (Cunningham and Cox, 2003; Genc, Erturk and Belgin, 2005; Ohl et al. 2009).

As it is known, hand hygiene is extremely important for all individuals, especially for children in terms of health protection. However, when the literature of domestic and international studies on the hygiene status of the hearing impaired children is examined, it is seen that the number of studies on oral hygiene is quite high. Hearing impaired children may show some differences in the development process depending on the characteristic of hearing impairment (Keilman, Limberger and Mann, 2007).

Their knowledge which is limited (restricted) due to the communicative problems that are particularly related to their hearing disability leads them to have more health-related complications (Biria and Soleimani, 2003). For this reason, discussion section of the study will be made in accordance with the literature.

In our study that was conducted to determine the personal hand hygiene habits of children with hearing impairment and behavioral changes after the training given, 43,8% of the children were (n = 7) male, 56,2% were (n = 9) female and the mean age of the children was  $13,05 \pm 5,04$ .

In the study of Ekim and Ocakci, evaluating life quality of the children with severe hearing

impairment, the distribution of hearing impaired children by gender was examined and it was found that 45,5% were female while 55,5% were male (Ekim and Ocakci, 2012). In the study that Sari assessed the hearing impaired primary school students' knowledge of social and ethical rules whose mean age was determined to be 11.1, it was found that 44,3% of them were females and 55,7% were males (Sari, 2009).

When sociodemographic characteristics of hearing-impaired children's parents were examined, it was concluded that 43,8% of the mothers (n = 7) were illiterate, 56.2% of the fathers (n=9) were primary school graduates, and 68.8% of the children were living with their mother, father and grandparents. In the study that was conducted by Akcamete and Kargin (1996), it was seen that 54.1% of the hearing-impaired children involved in the study were male, 58% of them were aged 12 and under this age group, 70.7% of them had severe hearing loss (Akcamete and Kargin, 1996). It was found that 57.5% of the mothers were aged between 31-40, 60.8% of them were primary school graduates.

Learning many skills which are necessary to live independently begins at an early age and is acquired by modelling or learning from the people around. It is the same way that a child with a disability or learning disability also acquires these skills through imitation. However, limited imitation ability of the children with disabilities and their lack of learning through observation may hamper their acquiring self-care skills (MEB, 2009).

According to the results of the study we conducted, it was determined that all the children had a toilet, sink and water both at their homes and schools. 56.2% of them (n=9) had a training on hand hygiene before while 43.8% of them (n=7) did not. None of them had a health problem with their hands. The hearing-impaired children were given 'Hand Hygiene' training in order to develop their hand hygiene behaviours and a statistically significant difference was found in total mean scores between pre-test (before training, first measurement) and post-test (after training, second measurement).

In the study conducted by Sari et al. to compare oral hygiene status of the children with hearing, visual and orthopedic disabilities, the group of hearing-impaired children gave the best results in terms of oral hygiene habits (Sari et al., 2012).

The results of this study showed that the hearing-impaired children gave much more importance to oral hygiene than other children in the groups.

In the study conducted by Akcamete and Kargin to identify the needs of parents with hearing-impaired children, the area in which mothers indicated the need most was the 'Information Requirement' dimension of the scale used. In this dimension, 'I need more information on how to teach my child some skills' came first with 78.3% as the option required most (Akcamete and Kargin, 1996). This group also became maximum requirement specified group in the study by Sucuoglu (Sucuoglu, 1995). In our study, it was thought that children may not be aware of the fact that they did not receive such a training (education) before because of the significantly higher post-training behaviour scores.

According to World Federation of the Deaf, 80% of the hearing-impaired people are illiterate (do not know how to read and write) or have a very low education level (Abo et al., 2010). Therefore, at the end of the training (education) given, the emergence of meaningful differences may be due to the learning situations that they do not know before.

In the study conducted by Ahmadi, Abbasi and Bahaadinbeigy in determining the basic health needs of the hearing-impaired children in primary school and providing education by using sign language and video demonstrations, the statements of the teachers of the children were included. According to the most of teachers' statements, basic health needs of the children were to wash hands and face, toes and nails to be cared, and to have a bath correctly. While all their teachers agreed on their lack of oral and ear hygiene, half mentioned about their lack of hair hygiene and hygiene during their menses (Ahmadi, Abbasi and Bahaadinbeigy, 2015).

The results of the limited literature on this subject and the results of our study show similarity. In parallel with the results, studies on hand hygiene of the hearing-impaired children should be given more attention.

### Conclusion and Recommendations

As a result of the study, it was concluded that hand hygiene training (education) increased the behaviours of the hearing-impaired children towards hand hygiene. Hearing impairment also

negatively affects the child's quality of life. It is a fact that school-family cooperation is an important issue in increasing the independence level of the hearing-impaired child and adapting to social life (Donmez, Bayhan and Artan, 2000; Sunal and Cam, 2005). It is necessary for the health professionals to develop school health services in schools where children with disabilities are educated and encourage their colleagues working there to plan educational programs based on the needs of the child. The parents the closest institution to the child should also give priority to the attempts of the child to cope with the problems caused by his/her inadequacy. In addition, the use of computer programs such as videos and video clips in the education of these special children has been found to be effective in the studies and it is recommended that it be generalised.

### References

- Abo El-Soud M, Hassan AE, Kandil MS, Shohieb SM. (2010). A proposed Web Based Framework E-Learning and Dictionary System for Deaf Arab Students. *International Journal of Electrical & Computer Sciences*, 10(1): 1-9.
- Ahmadi M, Abbasi M, Bahaadinbeigy K. (2015). Design and Implementation of a Software for Teaching Health Related Topics to Deaf Students: the First Experience in Iran. *Acta Inform Med.*, 23(2): 76-80.
- Akcamete, G., & Kargin, T. (1996). Determining the needs of mothers with hearing impaired children. *Special Tendency Journal*, 2 (2), 7-24. (in Turkish)
- Akkok, F. (1991). Family guide in the education of disabled children. *Special Education Journal*, 1 (1), 5-8. (in Turkish)
- Beyazova, U., & Cagatay, G. (1991). Child health and development. Ankara: Hatipoglu Publications. (in Turkish)
- Biria M, Soleimani M. (2003). An assessment of oral & teeth's health status of 12 and 15 years old Boys of Tehran deaf 's schools, Iran 1379. *Journal of Dental School Shahid Beheshti University of Medical Sciences*, 21(3): 310-318.
- Biröl, L. (2000). Nursing process. Izmir: Bozyaka Printing House. (in Turkish)
- Bulut, A. (2003). Children's health and diseases. Istanbul: Nobel Medical Bookstores. (in Turkish)
- Cunningham, M., & Cox, E.O. (2003). The committee on practice and ambulatory medicine and the section on otolaryngology and bronchoesophagology hearing assessment in infants and children: Recommendations beyond neonatal screening. *Pediatrics*, 111(2), 436-440.

- Donmez, N., Bayhan, P., & Artan, I. (2000). Examining the expectations and concerns of families with disabled children. *Journal of Social Services*, 11, 16–24. (in Turkish)
- Ekim, A., & Ocakci, A. F. (2012). Quality of life in hearing-impaired children aged 8-12 years. *Ankara Health Services Journal*, 11 (1), 17-23. (in Turkish)
- Genc, A. G., Erturk, B. B., & Belgin, E. (2005). Newborn hearing screening: From the beginning to the present. *Journal of Child Health and Diseases*, 48, 109-118. (in Turkish)
- Keilman, A., Limberger, A., & Mann, M. J. (2007). Psychological and physical well-being in hearing impaired children. *International Journal of Pediatric Otorhinolaryngology*, 71(11), 1747-1752.
- Guest, D. (2006). Comparison of psychosocial development of 7-11 age group children with and without hearing impairment in Zonguldak city center. Unpublished master's thesis. Zonguldak Karaelmas University. Institute of Health Sciences, Zonguldak. (in Turkish)
- Metin, N. (1996). Problems encountered in integration applications. Speech presented at the Disabled City and Environment Congress, Disability and Education Problems Panel. (in Turkish)
- Ohl, C., Dornier, L., Czajka, C., Chobaut, J. C., & Tavernier, L. (2009). Newborn hearing screening on infants at risk. *International Journal of Pediatric Otorhinolaryngology*, 73(12), 1691–1695.
- Ozsoy, Y., Ozyurek, M., & Eripek, S., (2001). Children in need of special education “Introduction to special education”. Ankara: Karatepe Publications. (in Turkish)
- Oztekin, Z., & Kubilay, G., (1993). Community health and nursing. Ankara: Somgür Publishing. (in Turkish)
- Sarı, M. E., Kalyoncuoglu, E., & Cankaya, S. (2012). Evaluation of physically disabled children in terms of oral and dental health. *Atatürk University Journal of the Faculty of Dentistry*, 22 (1), 7-13. (in Turkish)
- Sucuoglu, B. (1995). Determining the needs of parents with disabled children. *Journal of Child and Youth Mental Health*, 2 (1), 10-18. (in Turkish)
- Sunal, S., & Cam, O. (2005). Investigation of the psychological adjustment levels of pre-school hearing impaired children. *Journal of Child and Youth Mental Health*, 12 (1), 11-18. (in Turkish)
- Sahin, H. (2004). Whose Problem is Disability? Individual ?, Society ?. *Journal of Devotion*, 1 (1), 48-64.
- Turkey Statistical Institute (TSI) (2011). Disability statistics. Ankara: Access address: [http://www.tuik.gov.tr/PreTablo.do?alt\\_id=1017](http://www.tuik.gov.tr/PreTablo.do?alt_id=1017). (in Turkish)
- T.R. Ministry of National Education (MEB) Strengthening the Vocational Education and Training System Project. (2009). Child development and education, self-care in special education. Ankara. (in Turkish)
- Yellow, H. (2009). Comparative evaluation of the knowledge about social and ethical rules of hearing impaired students studying in different environments. *Selcuk University Social Sciences Institute Journal*, 21, 391-406. (in Turkish)