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The Impact of an Interactive Educational Program to Improve Hand-washing Compliance among Preschoolers in a Hungarian Kindergarten

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ABSTRACT

Background: *Hand wash morale is changing among health workers and, despite many efforts; it is not always possible to achieve lasting improvement. Considering the fact that today's preschoolers are tomorrow's health workers, hand washing is one of the habits that should be strictly acquired earlier in life. The purpose of this study is to investigate whether hand washes morale among preschoolers can be improved by introducing a regular educational program.* ***Methods:*** *As a part of the collaboration between the County Hospital and an urban kindergarten, we have developed an interactive educational program that involves both health professionals and kindergarten teachers. The program disseminated information about hand washing and hand hygiene through children's stories, songs, video films, hand washing puzzles, and board games. Kindergarten teachers held the training sessions twice a week. Before and after the introduction of the program, we examined the children's hand washing patterns using a UV light kit.* ***Results:*** *Before the introduction of the educational program, only 12.3% of children were able to wash their hands properly. This figure increased to 44.3% after the introduction of the interactive educational program. There were no significant differences between boys and girls, neither in the pre-intervention nor in the post-intervention phase.* ***Conclusions:*** *Hand wash morale for preschool children can be improved through regular interactive educational programs. Through these, children can be induced to compete among themselves to have a cleaner hand. In our opinion, this can be transformed into a multiplier that needs to be further strengthened in the elementary school.*

Keywords: Hand wash, Interactive educational program, Pre-intervention, Post-intervention

INTRODUCTION

It is well known that a number of hospital-acquired infections (HAIs) are transmitted through the hands of hospital professionals [1,2]. Some reports demonstrated that HAIs can be reduced by increasing hand hygiene compliance in health-care facilities [3,4]. Measures to increase hand hygiene compliance, e.g. secret observers, lead to a transient improvement in compliance rates [5]. However, daily audits cannot be performed in every health facility and at all times. It is a frightening prospect if the professional staff is unconcerned about and show unawareness of the correct hand washing process, obligatory time and the importance of hand washing. Although progress can be made in this area through regular education and surveillance, the details of proper hand washing should be inculcated as a habit that one learns as a child, a habit that is difficult to change during adulthood.

Keeping in mind that today's kindergarten children are tomorrow's hospital professionals, we attempted to investigate the knowledge of kindergarten children in the field of hand hygiene and to examine whether it is possible to further develop home-learned habits.

MATERIALS AND METHODS

With the cooperation of the county hospital's department of infection control and a municipal kindergarten, we performed an observational, prospective, quasi-experimental study among 100 kindergarten children with a target age of 3-7 years. At the beginning of the study, we evaluated whether the children's hand washing technique was appropriate. Hand washing was considered appropriate if hand coverage was more than 90%, and inappropriate if coverage was less than 90%. Later on, during the course of the study, children aged 3 years (n=3) were excluded from

the study upon the request of kindergarten teachers. Total of 12 children showed appropriate hand washing at the beginning of the intervention. A total of 97 children were involved based on an unknown probability and no random convenience sample selection. The study sample consisted of 49 girls and 48 boys.

The aim of the study was to assess whether home-learned hand washing habits could be improved by an interactive educational program in the target study population. Table 1 shows the distribution of age and sex in the study population.

Table 1 Distribution of age and sex among the study population

Age (years)	Study population n=100 (97)	Boys n=49 (48)	Girls n=51 (49)
3	3	1	2
4	32	15	17
5	22	12	10
6	26	14	12
7	17	7	10

The final population number is shown in brackets (after the exclusion of 3-year-old children).

We decorated the walls of the kindergarten with posters of hand washing and images of Ignác Semmelweis (known as "the savior of mothers"). We provided soap self-dispensers on the walls of the educational rooms, in the toilets and the halls. After that, we introduced a 3-month interactive hand-washing educational program (including stories, video images, puzzle, and board games) twice a week, which included the teaching of the proper technique of hand washing, the concept of bacteria and the role of hands in the transmission of diseases. The study was divided into 2 phases: the pre-intervention phase and the post-intervention phase.

We evaluated the level of proper hand hygiene among the study population in the pre- and post-intervention phase using a hand washing UV light kit (Dema LiteCheckR, Hartmann LTD, Budapest). Children washed their hands with an alcoholic-base disinfectant mixed with a UV glow. Under the UV light, the even coverage of the UV glow was evaluated. After evaluation, a thorough teacher-guided hand wash was performed to remove all UV glow off the children's hands.

RESULTS

In the pre-intervention phase, 12 (12.3%) children washed their hands properly. In the post-intervention phase, this number increased to 43 (44.3%; p=0.05). The techniques and quality of hand washing improved in children aged 4-7 years before and after the intervention (Figures 1 and 2).

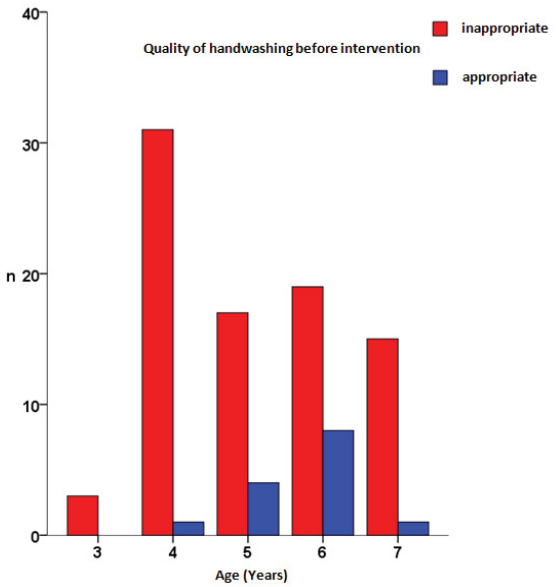

Figure 1 Rates of inappropriate/appropriate handwashing among children of different ages before the intervention

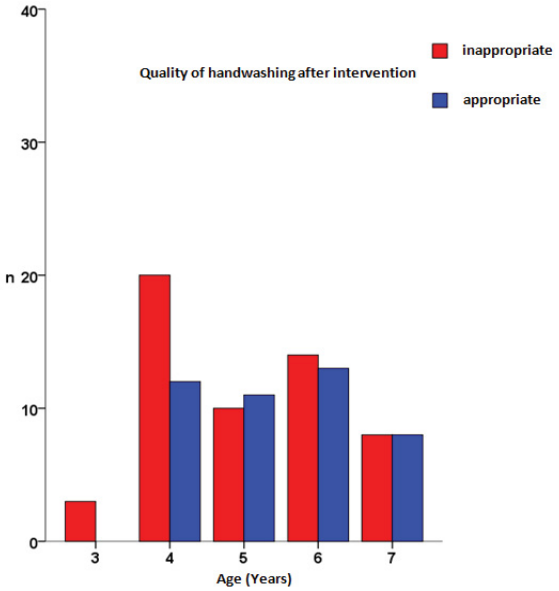

Figure 2 Rates of inappropriate/appropriate handwashing among children of different ages after the intervention.

We found no statistical difference between boys and girls, in the pre- or post-intervention phase (Figures 3 and 4).

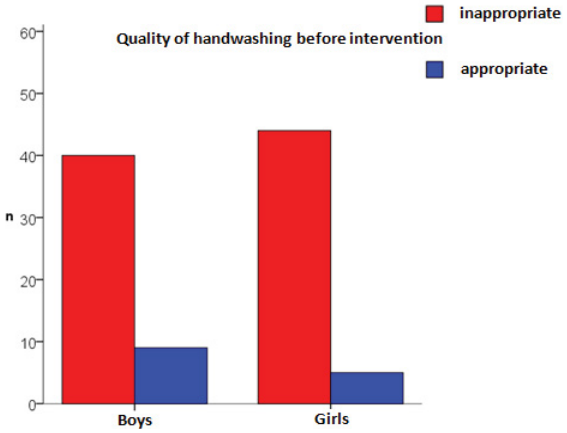

Figure 3 Rates of inappropriate/appropriate handwashing among girls and boys before the intervention

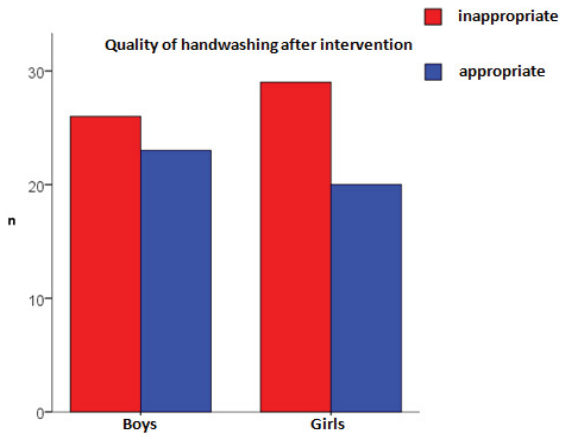

Figure 4 Rates of inappropriate/appropriate handwashing among girls and boys after the intervention

The hand washing adequacy of another 20 (20.6%) children were improved, and the UV light evaluation showed more hand coverage in the post-intervention than in the pre-intervention phase. However, the hand coverage of these children was less than 90%, so they were incorporated in the inappropriate handwashing group.

DISCUSSION

Many infection control measures usually address the prevention of infection in the hospital setting. We think that little is done to prevent hospital infections by changing the behavior of health professionals. Hand hygiene is undoubtedly an important element in infection control and prevention programs [6]. Hand hygiene compliance in healthcare facilities is usually not satisfied with the improvement shown when the same is observed and monitored, but it declines in the absence of sufficient supervision. Observation, measurement, and monitoring of hand hygiene compliance, though effective, are also time and resource consuming. We think self-monitoring may be more effective and less resource consuming in improving hand hygiene compliance and controlling healthcare-related infections. In our reading, this means that every health worker should be able to monitor their own hand washing habits and improve those if needed. In order to achieve this goal, something should be done even at the time when the hand washing habits have not yet become customary. We believe that if we can teach children the importance of correct hand washing, correct handwashing techniques, and their social impact, a more conscious generation would emerge, who-if they were to become health workers would have to invest less energy in monitoring their hand washing compliance.

When communicated by adults, children are capable of realizing the things that benefit them [7]. The social significance of handwashing may be one such matter. However, children under 3 years of age are not yet able to grasp the importance of hand washing or the proper technique, so it might be unnecessary to start similar educational programs in nurseries.

Intervening through a multilateral program can change and help perfect children's hand wash patterns, urging them, in the process, to be better. This should be later customized and, in our opinion, continued until at least the age of 12 years. From this point on, we think it will be much more difficult to deviate from this habit.

There is no difference between boys and girls when it comes to hand washing. Regardless of gender, it is important to learn the right techniques and gain the necessary knowledge.

CONCLUSION

Improving handwashing compliance of adult health workers may be a gradual process, which should be started at pre-school age and continued until the lower school age. Starting an early hand washing compliance plan by introducing interactive educational programs among preschoolers may be one of the measures that help improve handwashing compliance among adult health workers. This may be a cornerstone element in preventing hospital-acquired infections.

DECLARATIONS

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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