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Nutrition Education Effects on Better Hand Hygiene Practice Among Adolescent Girls

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Abstract Personal hygiene including hand washing, food preparation, and food diversification consciousness can be grown through nutrition education. A randomized controlled trial study was conducted on five hundred adolescent girls. In baseline study participants were randomly assigned to a control and an intervention group where both groups had the same number of adolescent girls. The hand hygiene behavior of 250 adolescent girls was studied to determine how hand washing practice and hygienic materials using practice changed by nutritional education, focusing on hand hygiene. In end line, 241 adolescent girls from intervention group and 236 from control group were interviewed. Most of the adolescents (more than 60%) washed their hands 2 times after defecation and before eating both in the control and intervention group. In the intervention group, hand wash practice after defecation, before eating, and before food preparation increased in 16% of adolescents where baseline was 20.0% and the end line was 36.1%. In where the percentage was almost same in the control group at baseline (27.2%) and end line (27.5%). Almost everybody (97.5%) in the intervention group washed their hands with soap and water at the end line of the study which was slightly less by 5.6% percentage at the base line of the study. Nutrition education increased the hand washing practicing behavior of the adolescents and the tendency to use hygienic materials for hand washing.

Keywords: *adolescence girls, behavior, hand-washing, nutrition education*

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1. Introduction

According to the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases. Hand washing or hand hygiene is the act of cleaning one's hands with or without the use of water or another liquid, or with the use of soap for the purpose of removing soil, dirt and /or microorganisms. It is the simple most effective method of decreasing infections and a generic route to manage transfer of infections.

Hand washing can reduce the spread of infections obtained by external contact, eliminating between 12% and 40% of all gastrointestinal diseases and over 20% of all infections [1,2,3,4,5]. Proper hand hygiene involves the use of soap and warm, running water, rubbing hands vigorously for at least 20 seconds. The WHO recommends hand washing with ash if soap is not available in emergencies, schools without access to soap and other difficult situations like post-emergencies where use of (clean) sand is recommended too. Use of ash is common and has in experiments been shown at least as effective as soap for removing bacteria.

Hand washing is the most important way to reduce the spread of infection. When hand washing is done correctly by children and adults there can be a 17% reduction in respiratory infections for young children. This translates to prevent more than 100,000 colds per year [2]. Unhygienic preparation of foods can cause contamination. Food contact with unwashed hands can be a source of diarrhea pathogens [6,7,8].

Nutrition Education is any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels (According to Society for Nutrition Education and Behavior). Nutrition education is more likely to be effective when it focuses on behavior and action rather than only knowledge and is systematically linked to educational theory [9].

Adolescence refers to a period of 10-19 years while rapid physical, psychological and emotional changes

occur and additional nutritional demands increase for the proper development of their body [10]. The aim of the present study is to evaluate the role of nutrition education emphasizing on hand wash on hand washing behavior. It also evaluates the hygienic hand washing materials used propensity of the adolescent girls of Bangladesh.

2. Methodology

For the first purpose of the study, a survey was conducted with 500 adolescent girls from three rural areas named Kaliyahoripur, Khokshabari and Saydabad under Sirajgonj district of Bangladesh from January 2014 to April 2016. The study was designed to evaluate the effect of nutrition education on better hand hygiene practice of adolescent girls aged between 10-19 years. Adolescent girls were randomly assigned to a control (250) and an intervention group (250) from those selected areas.

Nutrition education including hygienic practice was provided to the intervention group through group or personal discussion using charts, leaflets, and posters while no nutrition education was provided to the control group. After two years both groups were assessed for this study. At end line, to evaluate the role of nutrition education on the adolescent girls, 241 adolescent girls from the intervention group and 236 from the control group were finally interviewed. Due to participant's unwillingness to continue the study and marriage at the time of the study, the drops out were occurred. In this study married and/or pregnant adolescent girls were excluded.

Adolescence girl's hand washing practice was categorized as 1 time (after defecation/before eating), 2 times (after defecation and before eating) and 3 times (after defecation, before eating, and before food preparation) in this study.

Through questionnaire cum face to face interviewing methods and study variables like socio-demographic, health and nutrition, personal hygiene and anthropometric measurements data were collected for this study. Using standard anthropometric techniques basic anthropometric measurement, height and weight were measured. Based on the height for age and BMI for age Z scores nutritional status was measured. Statistical package for social science (SPSS) software was used for data analysis. The significant difference on categorical variables between the intervention and control group were looked through Chi-square test and the significant value was set at $P < 0.05$. The Shapiro-Wilk test was used to check the normality of the continuous variables.

3. Results

Table 1 shows the hand wash practicing behavior of the adolescent girls within the intervention and control groups on the time frame of baseline and end line. Only 9.2% adolescents in the intervention group washed their hand after defecation/before eating at baseline. But this percentage was reduced greatly as close to zero at end line of the study. Washing hand after defecation/before eating also reduced from baseline to end line in the control group but the reduction in percentage was not as good as the intervention group. Most of the adolescents (more than 60%) washed their hands 2 times: after defecation and before eating both in the control and intervention group. It is a very common practice in Bangladesh to wash hands after defecation and before eating. Practicing hand wash 3 times (after defecation, before eating, and before food preparation) was noticed in less than 30% of adolescents both in the intervention and control group at baseline. From this data of our study, it might be hypothesized that washing hands before food preparation is not common in our country. In the intervention group, hand wash practice after defecation, before eating and before food preparation increased in 16% of adolescents at the end line from their baseline percentage of the study, whereas the percentage was almost same in the control group at baseline and end line. At the end line, the percentage of adolescents in the intervention group washed their hands after defecation, before eating and before food preparation increased in number from the adolescents in the control group.

Table 2 represents the material commonly used by the adolescents to wash their hand. Different materials such as ash, soil, soap, and water and the combination of these materials were used by these adolescents to wash their hand. Almost everybody in the intervention group washed their hands with soap and water at the end line of the study which was slightly less by 5.6% at the base line of the study. About 88% of the adolescent in the control group washed their hand with soap and water, and this percentage did not change from the baseline to the end line of the study. Very small percentage of adolescent girls used soil, ash, and water as the washing materials. Soil and water were used as washing materials less than 9% of the adolescent girls. None of the adolescents in the intervention group at the end line of the study used only water as washing material. Still, about 4% of the adolescents used only water as washing material but this percentage of girls was from the control group.

Table 1. Practicing behavior of hand wash

	Base line (%)		End line (%)	
	Control	Intervention	Control	Intervention
After defecation or before eating	10.4	9.2*	5.9	0.4
After defecation and before eating	62.4	70.8	66.5	63.5*
After defecation, before eating and before food preparation	27.2	20.0	27.5	36.1

Table 2. Material used in washing hand by the adolescent girls

	Baseline (%)		End line (%)	
	Control	Intervention	Control	Intervention
Only water	1.2	3.0	3.6	0.0
Ash and water	2.8	2.1	3.2	1.2
Soil and water	8.4	3.0	5.6	1.2
Soap and water	87.6	91.9	87.6	97.5

4. Discussions

This study was conducted two times: before and after nutrition education intervention while three times i.e. after defecation, before eating and before food preparation knowledge of hand hygiene are remarkable increased in the intervention group (20.0 to 36.1) after providing intervention, control group were same situation (27.2 to 27.5). This knowledge is necessary for the practice of proper hygiene in the household level. This percentage was low due to less practice on hand washing before food preparation.

Washing hands after defecation is one of the most effective ways to prevent gastrointestinal parasitic infections [11,12]. While after providing intervention 87.6% from control and 97.5% from intervention of adolescent girls washed hand with soap after defecation and or other two stages.

This study targets two key issues that must be addressed when creating nutrition and hygiene promotion programs. First, only 27.5% from control group and 36.1% from intervention group after providing intervention have proper hygiene knowledge considering 3 times/stages. To increase this rate, adolescent clubs can be formed to teach adolescents about disease causation and transmission, demonstrate proper hand washing and hygiene practices, and provide motivation for good hygiene. Nutrition education has the potential to significantly alter the behavior patterns of students and can thereby lead to improved outlooks on hygiene. Second, much of hygiene practices are contingent upon availability of sufficient resources. Well-designed and well-located hand washing facilities and latrines that include adequate amounts of soap and water are essential in promoting better hygiene. Limitations of the study include that collected data from only three rural areas and among a small number of participants.

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