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The Effect of Child-to-Child Health Education Program on the Prevalence of Some Infectious Diseases and Personal Hygiene in Rural Primary School Children in Ismailia Governorate

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Abstract

Diseases related to bad personal hygiene are highly prevalent among children in rural areas. Child-to-child approach to health education was claimed to be of greater impact, in this age, than other standard health education processes and media. In this community intervention study, the hypothesis was that the group exposed to child to child intervention will have greater positive changes in the knowledge, attitude and practice (KAP) regarding personal hygiene compared to the other control group exposed to regular health education sessions conducted by health care providers. A sample size of 88 was estimated to be enough to detect a 20% increase in any KAP score of 30 or more and a SD of 20 or less, with $\alpha = .05$ and $\beta = .2$. Two hamlets, each providing the required sample size, were selected randomly from a total of 13, in the same village. The program was randomly assigned to one while the other served as control. All primary school children were included, 95 and 88 in the intervention and control groups respectively. The program consisted of training grade 5 students as trainers in the experimental group. Then the message was disseminated by them to younger ones in regular sessions for one year. There was no possibility of contamination because the two sites were far away. Co-intervention was unlikely since the two areas are served by the same health administration. Results have shown no statistically significant differences between the two groups as regards socio-demographic characteristics, except for father occupation. The study group had significantly higher changes in the scores of knowledge, attitude, and behavior only after the intervention. The prevalence of some indicators and diseases of personal hygiene also significantly decreased in the study group after the intervention. The results point to the success of child-to-child approach in health education and should be considered in the school health programs.

Introduction

HEALTH education concerning prevailing health problems and methods of preventing and controlling them has been mentioned as the first of eight essential activities of primary health care according to Alma Ata Conference in 1978. Davis [1] indicated that the science of health education must always be concerned with change of behavior and attitude of the people. Moreover, Nash et al., [2] stated that health education should be directed to children, since wise health choices will then extend into healthy productive adult generations.

Child-to-child health education, according to Aarons et al., [3], is a new approach for educating young children simple hygienic habits by the elder peers who act as role models for them. No studies have been conducted in Egypt that deal with child-to-child health education and such studies are immensely needed as children represent a large segment of the community.

The aim of this intervention study was to determine the effect of child-to-child health education program regarding personal hygiene on school-age children. The specific objectives were firstly to assess changes in the prevalence of some infectious diseases that are related to insufficient hygiene, such as pediculosis, scabies, tenia capitis and tenia pedis, that come out as a result of child-to-child health education program regarding personal hygiene conducted by the trained older school children (grade 5) and secondly, to determine the changes in the personal cleanliness of children after implementation of the program.

Subjects and Methods

Study design: A quasi experimental design was used in which one community was chosen to receive the experimental intervention program and another community was selected to serve as reference area. In this design, both groups were pre-tested and post-tested. None of the control group was exposed to the intervention and none of the subjects has been assigned to groups. The following factors were taken into consideration when selecting the reference community to minimize biased results: (1) the geographical position relative to the intervention community, (2) the presence of similar resources, e.g., a school or a nearby school and (3) a nearly equal distance from the primary health care unit.

Target population: The target population were the rural primary school-age children in El-Tal El-Kebir district. The intervention group included all primary school children of El-Kelaneya hamlet (95 children), while the control group included all primary school children of El-Omda hamlet (88 children). Both the intervention and control communities were skirts of El-Quassassin El-Gadida village which is a land reclamation village whose skirts have nearly similar resources and socioeconomic pattern. The maximum land ownership per family in this village was 3 feddans. Each community had one primary school and one mosque. The two communities lied far away from each other by about 6 kilometers, which was considered enough to prevent the contamination bias and neither of the two communities had a primary health care unit.

The studied children in the experimental and control groups were clinically examined to detect: (1) some diseases related to insufficient personal hygiene such as pediculosis, scabies, tenia capitis and tenia pedis; (2) cleanliness (hygiene) of the teeth, skin, finger nails, underwear and ex-

ternal clothes.

Experimental manoeuvre: As child-to-child health education program emphasizes that older children pass on ideas to their friends and younger school children, grade "5" pupils in the intervention community received the health education program and were trained to become health educators. Three sessions per week for one and a half months were conducted by the research team who used the following teaching methods: demonstration, role playing, stories with pictures and group discussions. The program sessions were conducted in the school as well as at homes of some volunteer adult health workers who were interested in the activities of the program. The use of the school as a setting for our activities helped the implementation of the program by using its teaching aids and reaching all the children in the experimental group.

The trained older school children then passed on the program to the younger school children by using the same teaching methods (under supervision of the research team). Three sessions per week were conducted for the period of one month. Children in the control community received no health education activities.

The outcome of the child-to-child health education program was assessed in the present study by the change in the prevalence of some infectious diseases and in children personal cleanliness indicators, as well as the changes in their knowledge, attitude, and behavior scores. These latter changes were estimated from the percent change in the scores of the pre- and post-intervention questionnaire.

Data were statistically analyzed using Chi-square test of homogeneity for examining the changes in the prevalence of indicators of personal hygiene and related diseases, in the two groups. Student-*t* test was used to compare the magnitude of changes in knowledge, attitude and behavior. Stepwise backward multiple regression analysis with a value of 4.0000 for F to enter or remove, was used to examine the effect of the intervention on these changes, taking into consideration the socio-demographic characteristics as possible confounding variables.

Results

The intervention group included 95 children, while the control group included 88 children. No statistically significant difference was observed between the intervention and control groups as regards age (8.6 ± 1.8 and 9.1 ± 1.6 years respectively, $p > 0.05$). The two groups were similar as regards sex, father and mother education and occupation, except for father occupation which had a tendency to higher job classes in the intervention group. They shared similar housing conditions, land and house ownership, as indicators of socio-economic level (table 1).

Table (2) illustrates that the experimental group displayed significant differences as detected by clinical examination before and after intervention as regards the prevalence of some indicators of personal hygiene and diseases related to it. The same table shows that no significant changes were detected in the control group regarding the prevalence of the previous diseases and personal cleanliness items. It is noteworthy that the prevalence of clean teeth and clothes was significantly higher in the control group before the intervention. Also, while pediculosis was more prevalent in the intervention group at that time, tinea pedis was more so in the control

group and the differences were statistically significant.

On the one hand, the pre-intervention scores of knowledge, attitude and practice related to personal hygiene did not show any statistically significant differences. On the other hand, the post intervention scores and the mean changes between pre- and post scores were found to be statistically significantly higher in the intervention group. Table (3) displays the comparison of the mean changes. These changes were independent of the various sociodemographic variables. This was shown by the stepwise multiple regression analysis with the percent change in the score of each of the knowledge, attitude and behavior as dependent variables and the age, sex, father and mother education and occupation, house sanitation and condition, ownership and intervention as independent factors. The categorical variables were entered in the model as dummy ones. Knowledge and behavior positive changes were only dependent on the intervention and had a relatively strong "adjusted R-square", 0.53 and 0.60 respectively. The change in attitude depended mostly on the intervention, but also partly on mother occupation and still the "adjusted R-square" was high, 0.68. The model and its ANOVA are shown in table (4). The negative coefficient in the case of intervention is due to the use of the value of (1) for intervention and (2) for no intervention in the dummy variable in the model.

Discussion

Modification of children behavior is a complex process which should be based on sound principles of educational psychology for each age group. Bergler [4] emphasized the importance of using established rules of behavioral change in conducting health education. Blackham [5] indicated that there were several psychological methods for learning and modification of child behavior. Operant conditioning, instruction, modelling, shaping, contingency management and punishment can be used for strengthening desirable behavior in children.

Gohlke [6] succeeded in changing the smoking habit of juvenile school children using methods of instruction with reinforcement. The basic principle of this method, according to Baron [7], is that we acquire responses which yield desirable outcomes (positive reinforcers), or which help us to avoid or escape from undesirable ones (negative reinforcers). However, Blackham [5] pointed out that the strength of the response decreases when reinforcement is terminated. If reinforcement is withdrawn for a period of time, the response rate tends to return to the preconditioned rate.

In this study, we used the method of modelling through child-to-child approach. There were statistically significant differences between the pre- and post-test findings in children of the experimental group and no significant differences were found in the control group. So, we can conclude that older school children succeeded in changing health behavior of the younger children. This change in behavior was reflected in significant differences in the prevalence of diseases related to bad hygiene and in improved state of personal hygiene. In other words, older children succeeded in being role models and agents of change for their younger brothers, sisters and friends.

The results of this study were consistent with those of Craft et al. [8], who evaluated the effectiveness of a four-month in-

Table (1): Socio-Demographic Characteristics of the Studied Children in the Intervention and Control Groups.

	Study Group n = 95		Control Group n = 88		*p* -value
	#	%	#	%	
Sex:					
Male	52	54.7	51	58.0	>0.05
Female	43	45.3	37	42.0	
Father Education:					
Illiterate	34	35.8	34	38.6	
Read and write	35	36.8	28	31.8	>0.05
I ry and middle	16	16.8	20	22.7	
High	10	10.6	6	6.9	
Mother Education:					
Illiterate	72	75.8	68	77.3	
Read and write	2	2.1	5	5.7	>0.05
I ry and middle	19	20.0	14	15.9	
High	2	2.1	1	1.1	
Father Occupation:					
Skilled/Laborer	31	32.6	50	59.1	
Clerical	47	49.5	24	27.3	<0.05
Semi-prof. / prof.	17	17.9	12	13.6	
Mother Occupation:					
Housewife	81	85.3	83	94.3	>0.05
Employed	14	14.7	5	5.7	
Electricity:					
Yes	91	95.8	88	100.0	
No	4	4.2	0	0.0	
Water Supply:					
Yes	48	50.5	50	56.8	>0.05
No	47	49.5	38	43.2	
W.C. at home:					
Yes	78	82.1	63	71.6	>0.05
No	17	17.9	25	28.4	
Land Owners:					
Yes	38	40.0	39	44.3	>0.05
No	57	60.0	49	55.7	
House Owners:					
Yes	90	94.7	82	93.2	>0.05
No	5	5.3	6	6.8	

Table (2): Comparison of Some Indicators of Personal Hygiene and Diseases Related to it Before and After Interventionn in the Study and Control Groups.

	Pre-interv.		Post-interv.		*p* -value
	#	%	#	%	
Study Group (n = 95):					
Clean hair	51	53.7	73	76.8	<0.01
Clean teeth	22	23.2	60	63.2	<0.01
Clean skin	61	64.2	79	82.2	<0.01
Clean clothes	32	33.7	73	76.8	<0.01
Clean underwear	44	46.3	71	74.7	<0.01
Wearing shoes	58	61.1	80	84.2	<0.01
Clean cut hair	28	29.5	73	76.8	<0.01
Pediculosis	70	73.7	37	38.9	<0.01
Tinea capitis	11	11.6	4	4.2	<0.01
Scabies	58	61.1	22	23.2	<0.01
Tinea pedis	20	21.1	7	7.4	<0.01
Control Group (n = 88):					
Clean hair	52	59.1	52	59.1	>0.05
Clean teeth	68	77.3	67	76.1	>0.05
Clean skin	49	55.7	50	56.8	>0.05
Clean clothes	49	55.7	49	55.7	>0.05
Clean underwaer	40	45.5	48	54.5	>0.05
Wearing shoes	53	60.2	55	62.5	>0.05
Clean cut hair	38	43.2	38	43.2	>0.05
Pediculosis	21	23.9	22	25.0	>0.05
Tinea capitis	70	79.5	69	78.4	>0.05
Scabies	44	50.0	42	47.7	>0.05
Tinea pedis	62	70.5	62	70.5	>0.05

Table (3): Comparison of the Means of Changes of the Pre-Post Scores of Knowledge, Attitude and Behavior of the Intervention and Control Groups.

Pre-post changes in scores (%)	Study Group n = 95		Control Group n = 88		*p* -value
	Mean	S.D.	Mean	S.D.	
Knowledge	35.5	22.2	1.1	3.1	<0.01
Attitude	21.9	10.5	0.2	0.6	<0.01
Behavior	34.2	18.8	.8	3.5	<0.01

Table (4): Multiple Regression (Stepwise) Analysis of the Scores of Children Attitudes Towards Personal Hygiene as a Dependent Factor, and their Socio-Demographic Characteristics and the Intervention as Independent Factors.

(A) Best fitting model

Independent variables	Coeff.	S.E.	t -value	*p*
Constant	166.919	7.005	23.829	0.000
Mother occupation	17.108	7.367	2.322	0.000
Intervention	-83.586	4.427	-18.881	0.000

(B) Analysis of variance (ANOVA) for the full regression.

Source of variation	SSE	df	MSE	F	*p*
Model	328179.0	2	164089.0	189.84	0.000
Error	152991.0	177	864.4		
Total	481170.0	179			

R-square = 0.782 Adjusted R-square = 0.679

tervention program in which 31 siblings of 15 children with cerebral palsy were taught about cerebral palsy and what they could do to encourage their brothers or sisters to be independent. Teaching in their study was reinforced by home visits to develop individual plans for the children with cerebral palsy and sibling group meetings were held to discuss progress and to provide support. Following this intervention, the children with cerebral palsy had significantly increased range of motion of the shoulder, elbow and wrist. There were also improvements in ambulation, personal hygiene, dressing and feeding. These findings indicate that siblings should be involved in the plan of care for children with disability, since they can be important teachers, role-models and agents of change.

Modelling has been used with success in our study for the modification of children behavior regarding personal hygiene.

Modelling was frequently done by using a live human model (prestigious and warm children), or a symbolic model e.g., posters, role-playing and illustrated stories.

These kinds of studies needed to be repeated on large scale to demonstrate the effectiveness of child-to-child health education programs versus other methods of health education aiming at implementing healthy habits and behavior among children. Health visitors and general practitioners working in school health programs should make use of such method of health education to encourage healthy behavioral changes among children.

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