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Innovative Participatory Health Education (IPHE): It's Effect on Mothers' Knowledge, Behavior; and Under Five Year-Old Children Household Accidents Rate

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Abstract

Introduction: Accidents are emerging as a leading cause of childhood morbidity and mortality. The current study was aimed to determine the effect of Innovative Participatory Health Education (IPHE) on mother' knowledge and behavior, and secondly to determine its effect on household accidents rate.

Methodology: The study design was a randomized control trial. Mothers who had less than five year-old children were selected randomly for this study. From each administrative unit 30 households were selected as clusters in the intervention and control groups. Sample size was calculated as 300 mothers all were enrolled in the study. Training of 15 participants by IPHE was done for the selected mothers in the intervention group. Then post-test was conducted to assess score of mothers' knowledge and behavior about home accidents.

Results: Mothers household accidents mean score knowledge increased from 8.40 to 16.34 after the intervention in the intervention group. In the control group, it increased from 9.7 to 12.4. The mean score knowledge on immediate intervention increased from 10.40 to 14.42 in the intervention group and increased from 9.7 to 12.4 in the control group. The mean score behavior of mothers about prevention of household accidents increased from 35.4 to 43.0 after the intervention among the intervention group. However, it remained the same as 36.0 in the control group. The mean score behavior of mothers about immediate intervention was increased from 19.32 to 22.96 in the intervention group. The reduction in home accidents rate in the intervention group was from 81.3: 1000 children to 24.9:1000 children. However, the rate was increased from 81.9:1000 children to 95.9:1000 children in the control group.

Conclusion: IPHE has significant effect on reduction of household accidents among under five year-old children. Mothers' knowledge and behavior about under-five year old children home accidents improved after intervention with IPHE.

Keywords: Innovative participatory health education; Mothers home accidents; Diarrhea; Pneumonia

Introduction

Children are the future of every nation. As soon as they are mobile, they begin to explore the surroundings and play with new objects, which may cause accidents [1]. Furthermore, children are not able to sense danger in the same way as adults. Children have a very limited ability to react quickly and properly in an emergency situation and they have little control over their environment, which increase the risk of accidents and death [2].

Under five years-old children are at high risk for many accidents such as burn and fall [2]. Studies in four low-income countries found that 65% of childhood burns had occurred in and around home. WHO's report about childhood injuries stated that, injuries among under five year-old children increase with age between one to five years [3].

Although the causes of child mortality have changed over the last few decades, the magnitude of the problem remains overwhelming. While deaths due to common childhood diseases such as diarrhea, pneumonia continue to decline; accidents are emerging as a leading cause of childhood morbidity and mortality [4]. In recent years, WHO has worked on several initiatives to document the problem, and moreover, to increase the knowledge of households in dealing with childhood accidents and implementing home safety advices [5].

Treated as diseases, accidents are cured by prevention. Prevention of home accidents is a public health target. While a large number of trials have investigated the effectiveness of fall prevention programs, few focused on interventions embedded in the general practice setting

and its related network and there is no evidence regarding the use of public participatory health education for prevention [6,7].

United Nations State Members are committed to meet eight Millennium Development Goals (MDGs) by 2015. The fourth goal which is reduce under five year-old child mortality, will not be met byall countries if they do not include all causes of under-five year-old children deaths in their programs [8]. The Health Five Years Strategy of Sudan aimed to reduce under-five mortality rate to 70 per 1000 live births by 2015 compared to the estimated average of 122 in 2006 [9]. Data regarding less than five year- old children household accidents in Sudan is very scanty.

IPHE approach is practiced in order to build links between primary services and their users, and to improve health care quality. However, its evidence and effectiveness remains scanty. Direct intervention of providing health education and innovative approaches are needed to minimize household's accidents [10].

The process of community participation in delivering health services has been recently innovated and shifted from community-based to community-directed interventions [11]. The approach of community directed intervention develops ownership for participants to implement the program. IPHE has shown promising results in other similar interventions and settings but have not been tested with home safety. It appears, based upon limited data, that multi community-based interventions are most effective to reduce the risk of burn injuries [12]. To date, most accidents prevention efforts are concentrated in developed countries. The implementation of such interventions in developing countries has not been tested and evidence from developed countries is not suitable because the situation and the underlying causes are different (Figure 1).

Objectives

The current study was aimed to determine the effect of Innovative Participatory Health Education (IPHE) on mother' knowledge and behavior, and secondly, to determine the effect of IPHE on households accidents rate.

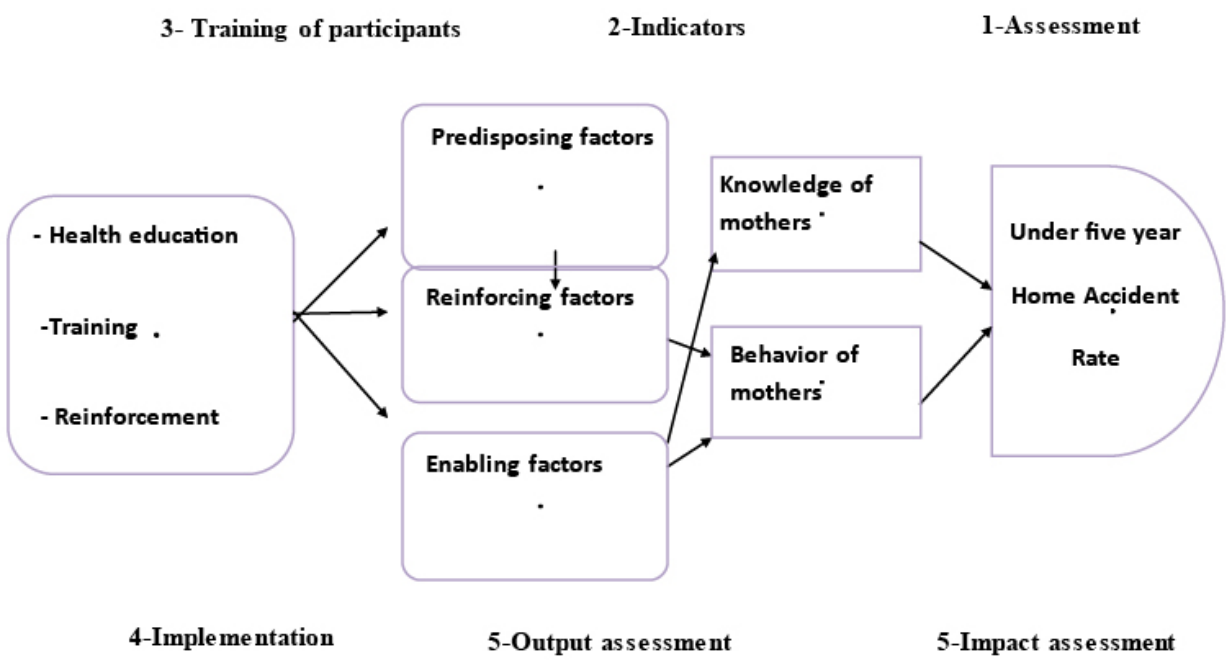

Figure 1: Conceptual model/Modified Precede and Proceed model Adapted from The Precede -Proceed model for implementing Health education: Source: [13].

Methodology

It was a randomized control trial study which was designed to assess the effects of IPHE on knowledge and attitude of under five-year children's mothers regarding home accidents and secondly, to determine the rate of children household accidents. The subjects were randomly assigned.

The population of this study was mothers who have less than five year-old children in the intervention and control cluster groups. Sample size was calculated based on the primary outcome of home accidents rate. Calculations were based on the equations of Hayes and Bennett [14] assuming two groups, unmatched clusters of approximately equal size. A value of k –between-cluster coefficient of variation – equal in intervention and control groups, and the addition of 2 to the estimated cluster number to account for loss of degrees of freedom consequent on stratification. The value of k was set at 0.30. A sample size of 10 clusters (five as intervention and five as control), had 80% power to detect a 30% fall in home accident rate at 95% significant level. Sample size was calculated as 300 mothers divided equally for both intervention and control groups. We used cluster random sampling technique to collect the data. Five out of the seven localities in Khartoum State, Sudan were selected by simple random sampling. Two administrative units were chosen from each locality,

one is rural and the other is urban, by simple random allocation. From each administrative unit 30 households with under five year-old children were selected as clusters. The data was collected by a pre-tested questionnaire to assess score of knowledge and behavior of mothers on home accidents among under five year-old children. The questionnaire was pre-tested and validated on 64 households. The percentage of agreement was high ranged from 58-100 % [15]. Training of 15 participants was done for 10 days to work as trainers for the selected mothers in the intervention group. They are volunteers accepted to participate in this work. Training by IPHE of mothers in the community by the 15 participants was conducted for four months. Then post-test was conducted on September 2012 after 9 months of the pre-test to assess score of mothers' knowledge and behavior about home safety and household accidents among under five year-old children. Knowledge was measured by Likert scale in pre-and post-tests, which set as zero and one for the false and the correct answers respectively. Behavior was measured by Likert scale in pre-and post-tests, which set as a scale ranging from zero to four.

The data was analysed by using Statistical Package for Social Sciences (SPSS) version 17. The normality of data was checked by Kolmogrov Smirnov test. Paired sample t-test was used to determine differences in score of knowledge and behavior between the two groups. Ethical approval was obtained from the Academy of Medical Sciences, Sudan. Registration for the trial was obtained from Pan African Registry (PAR). The number is (PACTR201301000469382). A written informed consent was obtained from all the participants in the intervention and control groups. Respect was realized for all participants. Confidentiality of data was preserved in this study. The right of the participants to withdraw any time was explained and preserved during the study (Table 1).

Results

Indicator	Intervention	Intervention group		Control group	
		Mean +S.D n=150	**p**	**Mean +S.D n=150**	P
Total knowledge about prevention	Before	8.40 ± 3.8	<0.001	9.7 ± 1.4	0.08
	After	16.34 ± 1.7		12.40 ± 1.6	
Total knowledge about immediate intervention	Before	10.40 ± 2.1	<0.001	10.72 ± 4.2	0.978
	After	14.42 ± 2.7		11.69 ± 2.8	

Table 1: Difference in score of knowledge about prevention and immediate intervention of household accidents (fall, burn) between intervention and control groups

(Table 1) shows the changes in score of knowledge and behavior of mothers about prevention and early intervention of under-five year-old children household accidents; mothers household accidents mean score knowledge increased from 8.40 to 16.34 after the intervention in the intervention group. In the control group, it increased from 9.7 to 12.4. The mean score knowledge on immediate intervention increased from 10.40 to 14.42 in the intervention group and increased from 9.7 to 12.4 in the control group.

Indicator	Interventi on	Intervention group		Control group	
		Mean +S.D n=150	**p**	**Mean +S.D n=150**	**p**
Total behavior about prevention	Before	35.40 ± 2.3	<0.001	36.99 ± 2.3	0.986
	After	43.00 ± 7.6		36.99 ± 3.2	
Total behavior about immediate intervention	Before	19.32 ± 2.5	<0.001	19.39 ± 4.2	0.694
	After	22.96 ± 3.7		19.68 ± 2.9	

Table 2: Difference in score of behavior about prevention and immediate intervention of Household accidents (fall, burn) between intervention and control groups

(Table 2) reflects changes in the mean score behavior of mothers about prevention of under five year old children home accidents, the mean increased from 35.4 to 43.0 after the intervention among the intervention group, and remained the same as 36,0 in the control group.

Changes in the mean score behavior of mothers about immediate intervention of under-five year-old children home accidents increased from 19.32 to 22.96 after the intervention among the intervention group, and increased from 19.39 to 19.68 in the control group.

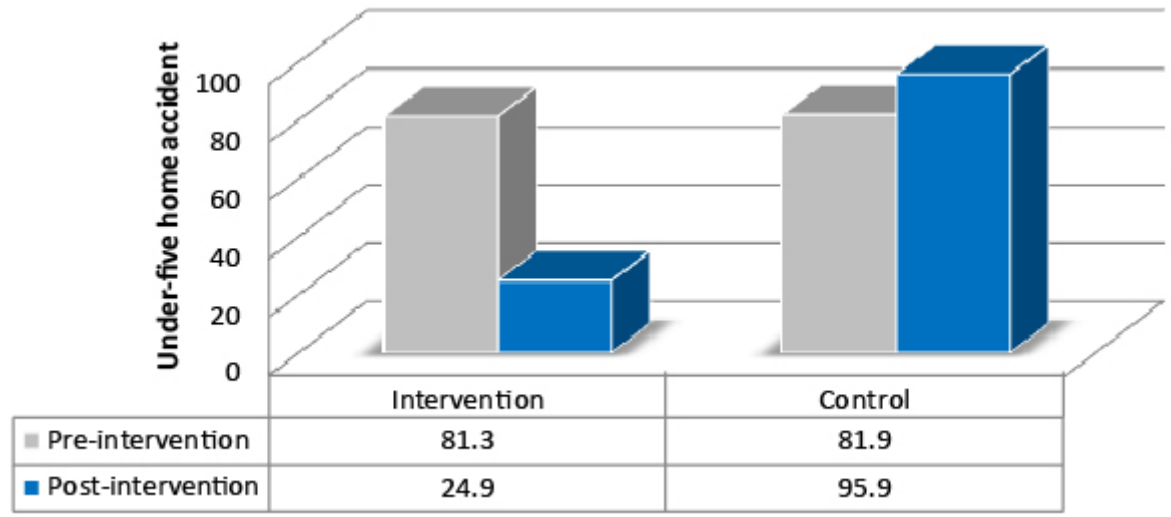

Figure 2: Difference in rate of household accidents (fall, burn) between pre and post-tests within intervention and control groups.

(Figure 2) reflects the difference in home accidents rate in the intervention and control groups in post-test compared to pre-test. The reduction in home accidents rate in the intervention group was from 81.3: 1000 children to 24.9: 1000 children. In the control group the rate of home accidents increased from 81.9:1000 children to 95.9:1000 children.

Developing pictogram of home safety

To develop pictogram for home safety, 15 mothers were selected by administrative units from intervention clusters to develop pictogram for home safety. The selected participants had educational background ranging from primary to university level education and they had less than five year-old children.

In order to develop a new innovative method of health education; it is needed to develop associated images that help to remind mothers what they want to apply. Each of the participants was asked to draw an image for each message about prevention and immediate intervention for under five year-old household accidents (fall/burn), keeping in mind that they will use these images to deliver the message later.

Afterwards, the drawings were filtered by the research team, which included an artist. Drawings that did not reflect the full meaning or were very similar to other drawings were excluded. They were then ranked and the best drawings, which best reflected each item was chosen. Each allocated drawing was passed around the research team and the participants were asked to write a comment. The drawings that did not clearly reflect the meaning were excluded. The remaining drawings were discussed and refined after combining the ideas.

The refined drawings were then carefully translated artistically into pictograms that mimic the original ones by the artist. Finally, the drawings, which are user friendly, were delivered to the trainers to be utilized in the training of the intervention group.

Discussion

The study revealed that; the baseline means score knowledge about prevention was 8.4 and 9.7 for intervention and control groups respectively. There is significant difference in the mean score knowledge about under five year-old household accidents prevention between pre- and post-intervention among the intervention group ($p<0.001$). IPHE home safety has an effect on improving score of mothers' knowledge about prevention of under-five year-old household accidents ($p<0.001$). Regarding the control group, association between pre- and post-tests is statistically not significant ($p=0.08$).

The level of mothers' means score knowledge about immediate intervention increased from 10.40 at pre-test to 14.42 at post-test among the intervention group and from 10.72 to 11.69 in the control group. The difference between pre and post-test is statistically significant in the intervention group ($p<0.001$). A study of implementation of an educational training programme about first-aid for a newly graduated nursery school teachers at Zagazig City, Egypt concluded that, health education programme led to significant improvement of knowledge about first aid [16]. Regarding the control group, association between pre- and post-tests is statistically not significant ($p=0.978$).

Regarding mothers' mean score behavior about prevention of under-five year-old home accidents in the present study; baseline mothers' behavior about prevention of household accidents was 35.4 and 36.99 for intervention and control groups respectively. The mean score behavior of mothers about prevention of under-five year-old household accidents had been increased after home safety training from 35.4 to 43.0 in the intervention group while there is no increase in the control group. The difference between pre- and post-test mean scores is statistically significant in the intervention group ($p=<0.001$). This finding is consistent with arandomized controlled trial for assessing the impact of increasing information to health visitors about children's accidents conducted in Nottingham city [17]. In the control

group, the difference between pre- and post- tests is not significant (0.98).

Baseline mothers' mean score behavior about immediate intervention was 19.32 and 19.39 for the intervention and the control groups respectively. Mothers' behavior about immediate intervention was changed from 19.32 at pre-test to 22.96 at post-test among the intervention group, and increased from 19.39 to 19.68 in the control group. The difference between pre- and post-test mean scores of behavior is statistically significant in the intervention group (p=<0.001). A study conducted to assess the effect of educational programme on knowledge, attitude and practice of injury showed that injury prevention programme demonstrated more positive behavior among the respondents [17]. In the control group, the difference between pre- and post-tests is not significant (0.694).

Home accidents rate was decreased from 81:1000 to 25:1000 under-five children in the intervention group due to IPHE home safety training. The difference at pre- and post-tests is statistically significant (p=<0.001). A study conducted in Israel showed effectiveness in the home safety programme in reducing burn related hospitalization [12]. In the control group the rate of accidents increased from 82/1000 at pre-test to 96/1000 under-five children at post-test.

Another study conducted by Michigan Health Department mentioned that; home accidents rate dropped by 50.4% after intervention by educating mothers. In another evaluation of a large scale, educational programme by the Michigan Health Department found that 27% of the households surveyed stated that they had followed some of the safety advice given. Although this was not a controlled study and many other variables could have accounted for the reduction, it is one of the few reports that showed a decrease in accidents rate after preventive programs. How effective education alone can reduce home accidents is not known [18]. Accidents prevention programs conducted in Israel reported effectiveness in reducing pediatric burn-related hospitalizations from 1.39 to 1.05 per 1000 infants, in contrast to areas where the program did not exist [12] and community-based injury prevention program in Harstad, Norway, resulted in a 52.9 percent reduction in burn injuries in children [19].

Limitation of the Study

The study limitations were short time of follow up, results for rate accidents would have been more realistic if measured after long time duration. Difficulty in keeping the study group for nine months was a challenge for the research team. The study was conducted in Khartoum State, Sudan. Such studies will yield more useful results if conducted in all over the country.

Conclusion

The present study provides evidence that Innovative Participatory Health Education IPHE has significant effectiveness in reduction of household accidents among under five year old children and improve home safety. Mothers' knowledge and behavior about prevention and immediate intervention for under five year-old household accidents improved after intervention with IPHE.

This study revealed that IPHE for home safety training is effective in enhancing a wide range of mothers' knowledge and behavior about prevention and immediate intervention of under-five year-old children household accidents.

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Authors' Contribution

All the authors contributed equally in this work.

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