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Research Article

Effects of Education Programs on School Students' Knowledge, Attitude, and Practice Regarding First Aid for a Choking Person in Saudi Arabia

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Abstract

Background: Choking and foreign body aspiration are significant causes of mortality and morbidity in young youngsters.

Objective: This study aimed to investigate the effects of education programs on school students' knowledge, attitude, and practice towards a choking person.

Methods: This quasi-experimental study with a pretest-posttest control group design included a total of 282 school adolescents aged 15 - 18 years enrolled by the convenience sampling technique. Researchers randomly divided participants into an intervention group (n = 141) and a control group (n = 141). After both groups completed the pretest, the intervention group received an education program on first aid for a choking person. Then, both groups were subjected to a posttest at the end of the program by the same pretest questionnaire. Descriptive and inferential statistics were used to analyse the data.

Results: There were no significant differences between the two groups within the study parameters at the pretest (P = > 0.05). However, at posttest, a significant difference was observed between the pretest and posttest mean scores of knowledge (p = 0.001), attitude (p = 0.024) and practice (p = 0.001) of the intervention group compared to the control group.

Conclusion: The intervention group showed significant improvement in the mean scores of school adolescents' knowledge, attitudes, and practices regarding first aid for a choking person. These changes in mean scores indicate the efficacy of the health education program. We suggest a continuous training program to improve competency in providing first aid for a choking person.

Keywords: *Education; School Adolescents; Knowledge; Attitude; Practice; Choking*

Introduction

Injuries are one of the causes of morbidity and mortality at all ages, but youngsters are more vulnerable worldwide [1]. Choking is a significant cause of mortality and morbidity in young students [2]. It is a severe medical condition characterized by a deficiency of oxygen to the brain. Choking leads to tissue damage and cell death within 4 - 6 minutes because of foreign object blockage of the throat or airway [3,4]. The fifth most common cause of unintentional injury deaths in the USA is foreign body aspiration. Eighty percent of FBAs occur in children younger than three years [5]. In Saudi Arabia, nontraffic unintentional paediatric injuries that occur under accidental circumstances such as falls, burns, ingestion of foreign bodies, and sports-related activities are common causes of morbidity, disability, and deaths. These injuries mainly occur because of children's lack of supervision from parents, an unsafe home environment and a lack of safety measures at home [6].

First aid is the initial treatment given to an acute illness or injury to preserve life, alleviate suffering, prevent further illness or injury, and promote recovery [7]. The endorsed first aid for choking individuals is to provide quick abdominal thrusts combined with back blows [3]. Choking and foreign body aspiration are preventable, and with enough knowledge and training, anyone can save the life of a cardiac arrest victim [2]. Students trained in first aid can respond effectively and provide immediate care for emergency cases such as choking, respiratory and cardiac arrest, bone fracture, strain, bleeding, and cardiopulmonary resuscitation [8]. Any person in any setting can provide first aid procedures, including individual self-care, to help people in life-threatening conditions maintain vital functions, which avoids worsening their health condition [7,9]. Although any person near the victim can provide first aid until professional help is available to save lives, performing first aid requires some knowledge [10]. Additionally, a lack of first aid knowledge in early childhood can lead to many school problems, such as failure to provide help and improper handling of victims, resulting in a deterioration of the situation [9].

Aim of the Study

This study aimed to assess the effects of health education programs on students' knowledge, attitudes, and practices towards a choking person in Saudi Arabia.

Methods

Study design, setting, subjects

This quasi-experimental study with a pretest-posttest control group design included a total of 282 school students aged 15 - 18 years enrolled at the Intermediate School of the Imam-SHATBY in Shaqra city, Saudi Arabia, on October 22, 2018. Researchers randomly divided participants into an intervention group (n = 141) and a control group (n = 141).

Sampling technique

The researchers selected samples using the convenience sampling technique.

Inclusion and exclusion criteria

The study included students who agreed to participate in and were available during the study. The study excluded students who disagreed with participating in the study and were not present during data collection.

Health education program development

The researchers developed the health education program contents of first aid for a choking person based on relevant literature reviews and had five experts validate them. The aim of this program was to improve the knowledge, attitudes, and practices regarding the delivery

of first aid for a choking individual. The program covered the introduction, causes of airway obstruction, signs, and symptoms of foreign body aspiration, primary assessment, and first aid procedures for airway obstruction. The program was applied during two class sessions; the time for each session was two 4-hour-sessions for both theory and four practical hours. The education program was presented using different teaching methods, such as lectures, group discussions, demonstrations and audio-visual materials, leaflets, and posters.

Questionnaire of the study

The researchers developed a self-administered questionnaire in the English language based on the literature review to assess the school students' knowledge, attitude, and practice regarding first aid for choking before and after health education intervention. Then, researchers translated the original questionnaire items into the Arabic language because Arabic is the country's primary language. Five experts checked the validity of the questionnaire content. For the pretest, 30 school students engaged in the pilot study to check feasibility and estimate the required time to complete the questionnaire for each respondent. The reliability test was performed from the pilot study. Based on the pretest findings, the researchers corrected for feasibility and excluded the pilot test participants from the main study.

Components of the questionnaire

The questionnaire comprises three sections. Section one includes demographic variables of the school students, such as the age of students, education level, parents' income, and previous training in first aid. Section two consisted of 4 items related to knowledge about first aid for a choking person. Section three comprised four questions to evaluate attitude towards first aid for a choking person associated with the five-point Likert scale ranging from strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point). Section four consisted of 4 items related to assessing school students' practice of first aid for a choking person. Respondents chose from two options: never do (0 points) and always (1 point). We gave each correct response 1 point and gave each incorrect answer 0 points. The total mean scores of knowledge, attitude, and practice were calculated before and after the health education program to evaluate the differences and effects of the program.

Data collection procedure

Data collection occurred in two periods: After both groups completed the pretest using the self-administered questionnaire, the intervention group received an education program on first aid for a choking person. Then, both groups were subjected to a posttest at the end of the one-day workshop program by the same pretest questionnaire to evaluate the effects of the health education intervention on the school students' knowledge, attitude, and practice regarding first aid for choking. Every participant was coded in the pretest and posttest of two groups to match the questionnaires.

Data analysis

The Statistical Package for Social Sciences (SPSS) version 25 was adopted for the data entry and analysis. Data analysis was run in four phases: homogeneity, exploratory, descriptive, and inferential data analysis. The chi-square test (X^2) was operated to examine the homogeneity of the nominal variables in the sociodemographic information of the intervention and control groups. In the exploratory data analysis phase, the Kolmogorov-Smirnova test was used (K-S) to check the normality of the data distribution, which denoted the data as having a nonnormal distribution in both samples of the intervention and control groups. Descriptive statistics were used to display data frequency, percentage, mean, and standard deviation. Since the data were nonnormally distributed, nonparametric tests were adopted in the inferential analysis, including the Mann-Whitney (M-W) test, to check the differences between the intervention and control groups in the pretest and posttest. Moreover, for the paired samples, the Wilcoxon signed-rank test was performed on the two groups to examine any differences between the pretest and posttest scores on the school students' knowledge, attitudes, and practices to evaluate the effects of a health education intervention regarding first aids for choking. The significance level was fixed at a p-value of < 0.05 in all results.

The Wilcoxon matched-pairs signed-ranks test and the Mann-Whitney U-test are nonparametric statistical hypothesis tests, and they work when the data does not follow a normal distribution. The Wilcoxon matched-pairs signed-ranks test can be used as an alternative to the paired Student's t-test to compare two related samples or matched samples to assess differences in the mean ranks of the sample population. However, the Mann-Whitney U-test for comparing differences between two independent groups is a nonparametric alternative to the independent t-test [11].

Results

Sociodemographic information

This study included a total of 282 school students involved in the education program. The intervention group included 141 participants and the control group had 141 students. The chi test (χ^2) showed significant differences between only the students who previously trained on first aid and those who did not prepare. However, there were no significant differences noted between the rest of the sociodemographic groups, such as age, parents' education, and parents' income, in the two groups of the study (P > 0.05) (Table 1).

Variables		Groups		Total	χ^2	df	P
Intervention		Control					
Age	< 15 years	57	49	106	3.001[a]	3	.392
	15 - 16 years	72	72	144			
	17 - 18 years	8	11	19			
	> 18 years	4	9	13			
Total		141	141	282			
Parents' education	Uneducated	14	14	28	5.641[a]	4	.228
	Primary	20	20	40			
	Intermediate	20	22	42			
	Secondary	4	13	17			
	College	83	72	155			
Total		141	141	282			
Parents' income	Low	23	28	51	.608[a]	2	.738
	Moderate	86	83	169			
	High	32	30	62			
Total		141	141	282			
First aid training on choking?	Yes	35	52	87	4.804[a]	1	.019*
	No	106	89	195			
Total		141	141	282			
Note: X^2 = Chi-Square Tests, *statically significant at P value < 0.05							

Table 1: *Sociodemographic information of the participants in two groups.*

To compare differences between two groups in the pretest and posttest

The normality of the data was tested in the two groups by the one-sample K-S test, which showed that the data of both the intervention and control groups at pretest and posttest did not follow a normal distribution. Therefore, A Mann-Whitney U-test (mean ranks and

p values) was used to compare the mean differences in the school students' knowledge, attitudes, and practices regarding first aid for a choking person at pretest and posttest between the intervention group (n = 141) and the control group (n = 141). The results revealed that there were no significant differences between the intervention and control groups in the school students' knowledge, attitudes, and practices at the pretest (P = 0.174 > 0.05) (P = 0.170 > 0.05) (P = 0.292 > 0.05), which indicated that the two groups were homogeneous at the pretest stage (before the education program). However, after the education program at the posttest, the mean rank scores of the intervention group increased significantly compared to the control group on the school students' knowledge (P = 0.015 < 0.05), attitudes (P = 0.001 < 0.05), and practices (P = 0.001 < 0.05). Therefore, H0 was rejected (Table 2).

Pretest in two groups							Posttest in two groups					
Variable	**Group**	**N**	**Mean Rank**	**U**	**Z**	**P**	**Group**	**N**	**Mean Rank**	**U**	**Z**	**P**
Knowledge	IG	141	135.13	9042.0	-1.359	.174	IG	141	152.94	8327.5	-2.430	.015
	CG	141	147.87				CG	141	130.06			
	Total	282					Total	282				
Attitude	IG	141	148.09	9011.0	-1.371	.170	IG	141	158.95	7480.5	-3.634	.000
	CG	141	134.91				CG	141	124.05			
	Total	282					Total	282				
Practice	IG	141	146.48	9239.0	-1.053	.292	IG	141	159.10	7458.5	-3.822	.000
	CG	141	136.52				CG	141	123.90			
	Total	282					Total	282				
Note. IG = Intervention group; CG = Control group, U = Mann-Whitney U test, P = statically significant at P value < 0.05												

Table 2: *Comparing differences between the two groups in the pretest and posttest.*

Comparison of the mean scores of paired samples between pretest and posttest in the two groups

The results of the S and K tests for the pretest and posttest data on school students' knowledge, attitudes, and practices of the control group were not distributed normally (p values were 0.001, 0.001, and 0.001). Thus, researchers used the Wilcoxon matched-pairs signed ranks test (z-scores and p values) to compare the mean scores of the school students' knowledge, attitudes, and practices regarding a choking person at pretest and posttest within the intervention group (n = 141) and control group (n = 141). The results of the Wilcoxon signed-rank test showed that there was no significant difference between the scores of the pretest and posttest of knowledge, attitudes and practices of the control group (P = 0.174 > 0.05), (P = 0.170 > 0.05), (P = 0.292 > 0.05), respectively. However, in the intervention group, there was a significant difference between the pretest and posttest mean scores of knowledge, attitudes and practices (Z = -3.415; p = 0.001), (Z = -2.262; p = 0.024) and (Z = -7.124; p = 0.001), respectively (Table 3).

Control group							Intervention group				
Posttest -pretest		**N**	**Mean Rank**	**Sum of Ranks**	**Z**	**P**	**N**	**Mean Rank**	**Sum of Ranks**	**Z**	**P**
K-Post - K-PRE	Negative Ranks	43	38.84	1670.00	-.247	.805	39	44.73	1744.50	-3.415	.001*
	Positive Ranks	37	42.43	1570.00			66	57.89	3820.50		
	Ties	61					36				
	Total	141					141				

A-POST - A_PRE	Negative Ranks	44	55.85	2457.50	-1.657	.098	54	57.89	3126.00	-2.262	.024*
	Positive Ranks	65	54.42	3537.50			73	68.52	5002.00		
	Ties	32					14				
	Total	141					141				
P_Post - P_PRE	Negative Ranks	36	35.56	1280.00	-1.166	.244	22	32.14	707.00	-7.124	.001*
	Positive Ranks	41	42.02	1723.00			88	61.34	5398.00		
	Ties	64					31				
	Total	141					141				
Note: K-Post - K-PRE = knowledge posttest -knowledge pretest, A-POST - A-PRE = Attitude posttest - Attitude pretest, P-Post - PPRE = Practice posttest -Practice pretest, based on Wilcoxon Signed Ranks Test, Z = Test Statistics, P = statically significant at P value < 0.05											

Table 3: *Comparing mean scores of paired samples between Pretest and Posttest in two groups.*

Discussion

Choking and foreign body aspiration are preventable, and with enough knowledge and training, anyone can save the life of a cardiac arrest victim [2]. This study aims to evaluate the effects of a health education intervention on school students' knowledge, attitudes, and practices regarding first aid for a choking person. The results of the current study revealed no significant differences between the intervention and control groups in the school students' knowledge, attitudes and practices at the pretest. However, after the education program at the posttest, the mean scores of the intervention group increased significantly compared to the control group on the school students' knowledge, attitudes, and practices. Our current result is consistent with a previous study that showed that middle and high school students had inadequate knowledge about foreign body aspiration [12]. However, in the posttest, the mean score of the school students' knowledge increased significantly regarding first aid for choking [13]. These findings agree with studies conducted in different countries comparing the effect of training on school students' knowledge, and they found that the level of students' knowledge about foreign body aspiration increased after training [14,15].

In the present study, there were no significant differences in the mean score of the school students' attitude regarding first aid for choking in the two groups at the pretest. However, at the posttest after administration of the health education intervention, the mean attitude score improved significantly in the intervention group compared to the control group. This improvement in attitude level might be attributed to health education interventions. Moreover, there were no significant differences observed in the mean score of the practice before the program between the intervention and control groups. However, in the posttest, the mean score of the students' training on providing first aid for a choking person increased significantly in the intervention group compared to the control group. Our results disagreed with a study conducted in Nigeria about the poor practice of first-aid among secondary school students. The study revealed that most of the respondents in the survey had fair knowledge, a positive attitude towards, and poor practice of first aid [16].

Similarly, a study conducted in Malaysia showed a significant association between knowledge and attitude, and students who scored higher on first aid answers displayed a more positive attitude towards first aid. Similarly, there were statistically significant relations between race and experience learning first aid [17]. These significant improvements in the school students' knowledge, attitudes, and practices at posttests in the intervention group compared to the control group may be attributed to the health education program, which indicated that the program was effective and may help school students provide first aid for a choking person in the future.

Strengths and Limitations

Even though our study denoted a significant improvement in knowledge, attitudes, and practices among intermediate school students after applying to the education program in the intervention group, the study has some limitations. First, this program was conducted in a

specific school; therefore, future studies should focus on different schools to maximize the benefits of such programs. Second, convenience sampling was adopted in data collection. Third, the program finished on the same day due to time constraints. Thus, this study's results might not represent all students of intermediate schools in Saudi Arabia. Therefore, we suggest further study in different schools of the kingdom to generalize the findings.

Conclusion

The current study revealed that the intervention group showed significant improvement in mean scores of school students' knowledge, attitudes, and practices regarding first aid for a choking person. These remarkable changes in the mean scores indicate the efficacy of the health education program that may help teenagers disseminate knowledge, positive attitudes, and skills to their families, which might increase public awareness in the future by providing first aid for a choking person more effectively. Furthermore, the efficacy of the health education program may guide policy-makers to introduce a first aid training program as part of the school curricula.

Recommendations

The authors of this study recommend that school authorities conduct a continuous training program to upgrade school students' competency in first aid for a choking person.

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Ethical Clearance

Before implementing the program, the authors obtained ethical permission to conduct this study from the College of Applied Medical Sciences of Shaqra University to the Director of the Education Department in Saudi Arabia's Shaqra Governorate before implementing the program (Ref. 6/10/2019). Furthermore, researchers explained the purpose of the survey to the school students and received consent from each participant before starting the study. All school students in this study agreed to voluntarily participate before proceeding to the questionnaire in the pretest and posttest. All responses were kept strictly confidential for research purposes only, and the results did not personally identify the respondents.

Declaration of Competing Interest

In this study, all authors have no conflicts of financial or personal interest to declare.

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Author Contributions

1-Study concept and design or acquisition, analysis, or interpretation of data by Mohammed A. Abdelmalik and Mohammaed O. Mohammaed. 2-Drafting the article or revising it critically for important intellectual content by Almoez M. Mohammed, Adel M. Abdalla, and Abdalrahman. 3-Final Approval of the version to be published by Binyameen M. Sambu and Ibrahim A. Abbakr. 4-Agreement to be Accountable for Accuracy and Integrity of all aspects of the work by Mohamed A. Beraima and A. Saeed.

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