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Effectiveness of an Education Program on Primary School Health Coordinators' Knowledge about Prevention of Infectious Diseases

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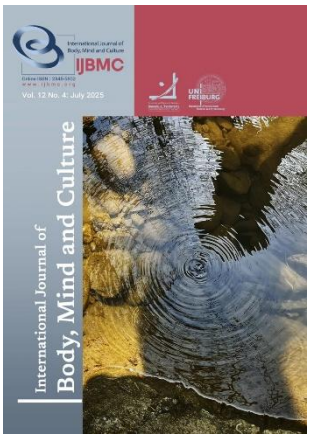

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ABSTRACT

Objective: Infectious diseases result from the transmission of microorganisms from a contaminated source to a healthy person, causing infection. Overcrowding in schools accelerates the spread of these diseases. Students gather in restricted areas, which facilitates the transmission of infection among them. Lack of awareness of proper personal hygiene methods also increases the likelihood of infection spreading. The study aimed to determine the effectiveness of the educational program on health coordinators ' knowledge about preventing infectious diseases.

Methods and Materials: An experimental study design was employed, utilizing the pre-test and post-test 1 and 2 methodologies. The study was conducted at the Educational Supervision Hall within the General Directorate of Education in Najaf City from 2024 to 2025. A stratified random sample of 204 health coordinators from primary schools in Najaf City was assigned to experimental (n = 102) and control (n = 102) groups.

Findings: The average age is 40 years, and Females represent a higher proportion in both groups. Most coordinators are married. The study findings showed significant differences in overall main domains relating to health coordinators ' Knowledge about preventing infectious diseases between pre- and post-tests 1 and 2 in the study group.

Conclusion: Insufficient knowledge among Health Coordinators on the Prevention of Infectious Diseases before implementing the educational program in the pre-test. The excellent effect of the academic program is evident in the knowledge of Health Coordinators in the study group, as indicated by the change in mean scores from post-test 1 to post-test 2. The research confirms that health coordinators' knowledge about infectious diseases is crucial, and most health coordinators in Al-Najaf City require training on prevalent infectious diseases and prevention methods.

Keywords: Education Program, Health Coordinators, Primary School, Prevention, Infectious Diseases.

Introduction

Infectious diseases represent a major burden on the stability of the economy and public health of countries, historically acting as the leading cause of mortality and disability while progressively presenting challenges to health security and human development. Globally, over 57 million individuals succumbed annually due to infectious illnesses (Wang et al., 2023).

Although the immune system works to fight these agents, some pathogens can re-emerge and spread. Therefore, understanding the mechanisms of infection, prevention, and control is crucial for protecting public health and mitigating the impact of these diseases on communities (Nii-Trebi, 2017; Webber, 2019).

The emergence of new illnesses and the persistence of longstanding infections underscore the importance of a comprehensive understanding of communicable diseases. The demand is especially evident in underdeveloped countries, where infectious diseases are a significant public health concern (El-Sayed Abd El-Hamid et al., 2018; Questa et al., 2020).

In schools, Iraqi teachers, workers, and students face a significant range of illnesses due to insufficient sanitary conditions and a widespread lack of hygienic procedures. Widespread ignorance of the risks associated with infectious diseases further exacerbates this health issue (Hussein & Yasir, 2018).

Strategies such as exclusion, ambient sanitation, hand hygiene, and promoting effective respiratory etiquette can be utilized to manage epidemics. Public health organizations may offer guidance and assistance to schools in epidemic management; however, numerous outbreaks are likely to remain unacknowledged and unreported (Donaldson et al., 2020; Wang et al., 2018).

Primary preventive strategies have become increasingly vital for minimizing the effects of illnesses at the individual, institutional, and societal levels (Atshan & Aziz, 2022; Dames et al., 2021). The primary preventive procedures aim to prevent infection in healthy individuals via concerted personal initiatives and the efforts of health institutions (Outwater et al., 2017).

Educational programs in schools are committed to promoting health by integrating health education into school activities. This integration aims to raise awareness about healthy nutrition, support mental health, promote awareness of the dangers of harmful behaviors, and encourage physical activity and disease prevention (Kalkım et al., 2024).

These programs are an essential part of educational policies, as they contribute to improving students' health through comprehensive strategies, including providing healthcare, promoting continuous awareness, and offering opportunities for community interaction. Thus, schools prepare a conscious and healthy generation capable of participating effectively in society (Ceka, 2024).

Health coordinators are in a position to advise educators on how to connect with other stakeholders on the educational team to ensure compliance with governmental health standards. This study aims to construct and implement an educational program for health coordinators to improve their knowledge of methods for preventing infectious diseases.

Methods and Materials

Design of the Study

An experimental study design (A randomized controlled trial) has been applied using the pre-test and post-test 1 and 2 methodology for two sample groups (study and control) within the specified period 2024-2025.

2.2 Administrative Arrangements and Ethical Considerations:

Before conducting the research requirements for this study, formal administrative permission and ethical approval were obtained from the College of Health and Medical Technology—Kufa, the Community Health Department, and the research committee at Al-Furat Al-Awsat Technical University. Subsequently, another approval was received from the General Education Directorate in the Al-Najaf governorate, and a third from the Al-Najaf Al-Ashraf Health Directorate.

All participants were informed that the study aimed to assess the knowledge of health coordinators regarding the prevention of infectious diseases. They were assured of the confidentiality of the information and that participation in the questionnaire was voluntary. After obtaining written consent from all participants (via an ethical permission form for research), the questionnaire was distributed, and participants were asked to complete it with confidence.

2.3. Settings of the Study

The researcher and supervisor collaborated with the General Directorate of Education in Najaf and the Public Health Department of the Al-Najaf Al-Ashraf Health Directorate/School Health unit to conduct health coordinator training workshops in the Educational Supervision Hall within the General Directorate of Education in Najaf City.

2.4. Sample of the Study

The estimated sample size, calculated using the Richard Geiger equation, was 210 participants, based on a population size of 462, a margin of error of 5%, and a 95% confidence level (Aday & Cornelius, 2011).

Inclusion Criteria: Health coordinators who agreed and were willing to participate in the study. Exclusion

Criteria: Health coordinators who were absent from the training workshops.

2.4.1. Sampling Technique

Stratified random sampling was applied to achieve the objectives of the study. Since each primary school has one health coordinator, the random selection was based on schools. The researcher prepared a list of primary schools within the Najaf Center and then carried out a random selection process for schools from the northern and southern sectors, which include private and governmental schools, using a digital computer to randomly select 210 schools out of 462, which ensures a fair process free of any order or bias. Identical criteria were used to determine the experimental and control groups.

2.5. Study Instruments

Part I: Sociodemographic characteristics such as Age, Sex, marital status, Number of children in the family, and educational level.

Part II: This section focuses on Health Coordinators' Knowledge of Infectious Disease Prevention, covering a total of 62 items. It includes 16 items on general knowledge of infectious diseases, seven items on signs and symptoms, eight items on transmission methods, and 20 items on prevention methods. The questionnaire also features 11 demographic items and uses a three-level Likert scale: True = 2, Not Sure = 1, and False = 0. Knowledge levels are categorized as Poor (0-34), Fair (34.1-68), and Good (68.1-102).

2.6. Validity of the Questionnaire and the Program:

An expert panel comprising 25 experts assesses the content validity of the initially created instrument to evaluate the questionnaire's clarity, relevance, and sufficiency in measuring the intended concepts, ensuring it meets the aims of the current study.

2.7. Reliability of the Questionnaire:

The Cronbach's Alpha and Pearson Correlation analyses are applied and show a good evaluation for the knowledge scale (0.896 and 0.885, respectively), indicating that the questionnaires have adequate internal consistency and equivalence measurability.

2.8. Data Collection and Analysis:

The Statistical Package for the Social Sciences (SPSS), version 28, was utilized for coding and analyzing the data. The Repeated Measure ANOVA, Independent sample t-test, and One-way analysis of variance Test were employed.

Findings and Results

Table 1 summarizes the descriptive analysis of school health coordinators. The average age is 40.7±10.8 years for the study group and 40±11 years for the control group, with the highest percentage (26.5% in the study group and 35.3% in the control group) in the "30-39 years" age range. Females represent a higher proportion, at 52.9% in the study group and 58.8% in the control group. Most coordinators are married: 75.5% in the study group and 79.4% in the control group. The majority have "1-3" children (42.2% in the study and 46.1% in the control), and 73.5% of participants hold a bachelor's degree compared to 75.5% in the control group.

Table 1

Distribution of School Health Coordinators According to Their Socio-demographic Characteristics

No.	characteristics		Study group		Control group	
			f	%	f	%
1	Age (year)	20 – 29	21	20.6	19	18.6
		30 – 39	27	26.5	36	35.3
		40 – 49	25	24.5	20	19.6
		50 – 59	24	23.5	24	23.5
		60 +	5	4.9	3	2.9
		Total	*102*	*100*	*102*	*100*
		M±SD	*40.7 ± 10.8*		*40± 11*	
2	Sex	Male	48	47.1	42	41.2
		Female	54	52.9	60	58.8
		Total	*102*	*100*	*102*	*100*
3	Marital status	Unmarried	21	20.6	15	14.7
		Married	77	75.5	81	79.4

		Separated	2	2	3	2.9
		Widowed/er	2	2	3	2.9
		Total	*102*	*100*	*102*	*100*
4	Number of children	None	31	30.4	29	28.4
		1 – 3	43	42.2	47	46.1
		4 – 6	25	24.5	24	23.5
		7+	3	2.9	2	2
		Total	*102*	*100*	*102*	*100*
5	Level of education	Preparatory (Course)	2	2	4	3.9
		Diploma	23	22.5	19	18.6
		Bachelor	75	73.5	77	75.5
		Postgraduate	2	2	2	2
		Total	*102*	*100*	*102*	*100*

The findings in Table 2 highlight a significant improvement in the overall knowledge of school health coordinators in the study group about infectious diseases following the intervention. In the pre-test, 49% of the study group had "Poor" knowledge (M = 48.87, SD = 5.70), but this dropped to 0% in post-tests I and II. Concurrently, the percentage of participants with "Good" knowledge rose dramatically to 99% in both post-tests, with a mean score increase to 97.67 (S.D. = 4.769) and 93.05 (S.D. = 4.513), respectively.

In contrast, the control group exhibited minimal change, with "Poor" knowledge decreasing slightly from 47.1% in the pre-test to 42.2% in post-test I and 43.1% in post-test II, while no participants achieved "Good" knowledge. The control group's mean scores remained relatively stable.

Table 2

Overall Assessment of School Health Coordinators' Knowledge about Infectious Diseases in the Study and Control Groups

Overall, Knowledge	Study Group						Control Group					
	Pre-test		Post-test I		Post-test II		Pre-test		Post-test I		Post-test II	
	f	%	f	%	f	%	f	%	f	%	f	%
Poor	50	49	0	0	0	0	48	47.1	43	42.2	44	43.1
Fair	52	51	1	1	1	1	54	52.9	59	57.8	58	56.9
Good	0	0	101	99	101	99	0	0	0	0	0	0
Total	*102*	*100*	*102*	*100*	*102*	*100*	*102*	*100*	*102*	*100*	*102*	*100*
M±SD	48.87 ± 5.700		97.67±4.769		93.05±4.513		47.76±7.171		47.18±6.949		47.80±9.925	

f: Frequency, %: Percentage, M: Mean of the total score, SD: Standard deviation of the total score; Poor 0 – 34, Fair 34.1 – 68, Good 68.1 – 102

From Table 3, it is evident that the RM-ANOVA test indicates a significant impact of the infectious disease education program on the knowledge of school health coordinators in the study group. This is demonstrated by the high significance associated with the "Greenhouse-Geisser" correction at a P value of 0.000 and a large effect size with a partial square of the era of 0.930. From the description, it is clear that there was a notable variation in the mean

Table 3

Significant Difference in School Health Coordinators' Knowledge about Infectious Diseases (Study Group, N=102)

Descriptive		Within-Subjects Effect							
Knowledge	Mean (S.D)	Source		Type III Sum of Squares	df	Mean Square	F	P-value	Sig.	Partial Eta Squared
Pre-test	48.87 (5.700)	Time	Sphericity Assumed	48787.471	2	24393.735	1333.738	.000	H.S	.930
Post-test I	97.6.7 (4.769)									
Post-test II	93.05 (4.513)		Greenhouse-Geisser	48787.471	1.546	31567.191	1333.738	.000	H.S	.930
			Huynh-Feldt	48787.471	1.565	31174.915	1333.738	.000	H.S	.930
			Lower-bound	48787.471	1.000	48787.471	1333.738	.000	H.S	.930
		Error (Time)	Sphericity Assumed	3694.529	202	18.290				
			Greenhouse-Geisser	3694.529	156.097	23.668				

	Huynh-Feldt	3694.529	158.061	23.374
	Lower-bound	3694.529	101.000	36.579

S.D: Standard Deviation, df: Degree of Freedom, f: F-statistic, P-value: probability value, Sig: Significance, H.S: Highly Significant

Discussion and Conclusion

Table 1 shows that most participants were females aged 30-39 years, and most were married in both groups. Most participants hold a bachelor's degree; it is worth noting that these results are consistent with those of a previous study that assessed the knowledge of primary school teachers on communicable diseases in the city of Mosul. The results indicate that most of the socio-demographic characteristics of the primary schools identified in this study suggest that the majority of the sample consisted of females who were married, with an age range of 30 to 39 years, and 49.7% having completed higher education. Most teachers have professional experience ranging from 1 to 10 years (55.0%) (Ayed et al., 2024).

Table 2 displays a significant improvement in the overall knowledge of school health coordinators in the study group about infectious diseases following the intervention. In the pre-test, 49% of the study group had "Poor" knowledge, but dropped to 0% in post-tests I and II. Concurrently, the percentage of participants with "Good" knowledge rose dramatically to 99% in both post-tests. In contrast, the control group exhibited minimal change, with "Poor" knowledge decreasing slightly from 47.1% in the pre-test to 42.2% in post-test I and 43.1% in post-test II. The study's findings align with those of Atshan et al. (2020), who found that primary school teachers in Al-Najaf city lacked sufficient knowledge about the disease and its methods of transmission prior to implementing their educational program. After the program, all teachers' knowledge about chickenpox increased significantly, which showed a notable difference. The study concludes that the effectiveness of an education program toward teachers' knowledge of chickenpox (Atshan et al., 2020).

The results are consistent with those of Thumil and Naji, who conducted a survey on teachers' knowledge of cholera infection and subsequently developed a health education program to improve their knowledge of infection control. The overall mean score indicates a high level of knowledge (2.46) among teachers after implementation of the educational program in the study group. In contrast, no changes in knowledge were observed between the pre-test and post-test among teachers in the control group (Thumil & Bahlol, 2016).

Insufficient knowledge among Health Coordinators on the Prevention of Infectious Diseases before implementing the educational program in the pre-test. The excellent effect of the academic program is evident in the knowledge of Health Coordinators in the study group, as indicated by the change in mean scores from post-test 1 to post-test 2. The research confirms that health coordinators' knowledge about infectious diseases is crucial, and most health coordinators in Al-Najaf City require training on prevalent infectious diseases and prevention methods.

Recommendation

1. The importance of collaboration between the Ministries of Health and Education to develop textbooks for primary school pupils regarding the nature of infectious diseases and their control measures. The textbook must explain the most prevalent diseases in schools and provide images and illustrations.

2. Reevaluating approved safety protocols and school standards to align with global standards.

3. Working on finding reliable records documenting emergencies and frequent infectious illnesses in schools to establish a database that facilitates more effective management of such events.

4. Enhancing the media's role in raising awareness about infectious disease prevention by utilizing radio, television, and magazines to distribute simplified health information on disease reduction, alongside improving water quality and sanitation in schools, particularly in rural regions.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

Following the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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