Assessing the Effect of an Educational Program on Nurses' Knowledge about Hemorrhagic Fever: A Quasi-Experimental Study

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الملخص

الأهداف: هدفت هذه الدراسة إلى تحديد فعالية برنامج تعليمي على معرفة الممرضات حول الحمى النزفية وإيجاد العلاقة بين معرفة الممرضات والبيانات الديموغرافية

المواد والطرق: تم استخدام تصميم شبه تجريبي من مجموعتين قبل الاختبار وبعده على عينة مقصودة من ١٠٠ ممرضة في مستشفى الصدر التعليمي في البصرة، حيث تلقت مجموعة الدراسة "برنامجًا تعليميًا" لمدة شهرين. تم جمع البيانات باستخدام استبيان تضمن التركيبة السكانية والمعرفة حول الحمى النزفية. تم تقييم درجات معرفة الممرضات قبل وبعد التدخل.

النتائج: أشارت النتائج إلى وجود فرق كبير إحصائيًا في درجات معرفة الممرضات قبل وبعد البرنامج التعليمي. كانت درجة المعرفة لمجموعة الدراسة بعد برنامج التدخل (متوسط ٣٨.٣٤٠٠ ± انحراف معياري ٣.٣٠٤٩٧، قيمة P 0.000)، وكانت مجموعة التحكم (متوسط ١١.٧٢٠٠ ± انحراف معياري ٤.١٨٩٣٢، قيمة P 0.000). وعلاوة على ذلك، لم تكن هناك علاقة مهمة بين البيانات الديموغرافية ومعرفة الممرضات بالحمى النزفية.

الاستنتاج: كانت معرفة معظم الممرضات بالحمى النزفية ضعيفة قبل البرنامج التعليمي، لكنها تحسنت بشكل ملحوظ بعد البرنامج. وبالتالي، يوصى بعقد ندوات تعليمية متكررة حول الحمى النزفية والأمراض المعدية للممرضات.

Abstract

Objectives: This study aimed to determine effective of an educational program on nurses' knowledge about hemorrhagic fever and find relationship between nurse's knowledge and demographic data

Materials and Methods: A quasi-experimental two-group pretest-posttest design was employed on a purposive sample of 100 nurses at Al Sadr Teaching Hospital in Basrah, with the study group receiving an "educational program" for two months. The data were gathered using a questionnaire that included demographics, knowledge about hemorrhagic fever. The nurses' knowledge scores were evaluated before and after the intervention.

Results: Results: The findings indicated a statistically significant difference in nurses' knowledge scores before and after the educational program. The knowledge score for the study group after the intervention program was (mean 38.3400 ± SD 3.30497, P-value 0.000), and the control group was (mean 11.7200 ± SD 4.18932, P-value 0.000). Furthermore, there was no significant relationship between demographic data and nurses' knowledge about hemorrhagic fever.

Conclusion: Most nurses' knowledge of hemorrhagic fever was poor before the education program, but it markedly improved after the program. Consequently, frequent teaching seminars on hemorrhagic fever and infectious diseases are recommended for nurses.

Introduction:

Viral Hemorrhagic Fever (VHF) is a severe febrile condition characterized by aberrant vascular regulation, vascular injury, and hemorrhagic manifestations, resulting from several viruses belonging to different families. Four families of viruses: Arenaviridae, Bunyaviridae, Filoviridae, and Flaviviridae, encompassing numerous genera and species that cause disease [(1)].

These viruses exhibit similar features, such as enclosed single-stranded RNA as their genetic material, a focus on primary dendritic, monocyte, and macrophage cells, cytoplasmic replication, and the induction of gastrointestinal and neurological symptoms. Severe cases correlate with increased viremia levels in the bloodstream. All four families of viruses are zoonotic, with reservoirs identified for each species except the Ebola virus (EBOV). Fruit bats are considered potential reservoirs for EBOV, yet only serological evidence and viral genomes have been identified [(2)].

Arenaviruses, Crimean-Congo hemorrhagic fever virus (CCHFV), and filoviruses may be transmitted to humans by arthropod bites or via indirect contact with the infected body fluids (feces, urine, saliva, and other fluids) of individuals suffering from viral hemorrhagic fever (VHF). Viruses responsible for VHF often exhibit a zoonotic life cycle and are geographically restricted. Humans are regarded as incidental hosts, but several arthropods and rodents function as efficient repositories for viral transmission. VHF might readily disseminate to other regions because to the rising volume of international visitors [(3)].

The clinical manifestation and severity of VHFs vary according to several parameters, including the kind of causative agent and the epidemiological and clinical features of the host [(4).]

Consequently, comprehending the processes that regulate the pathogenesis of VHF may facilitate improved therapy alternatives [(5).]

VHFs were first categorized together because to the similarity of their signs and symptoms. Patients may first exhibit fever and general malaise like to that seen in other prevalent tropical diseases, such as malaria and typhoid. The infrequency of VHF, coupled with nonspecific symptoms, obstructs the diagnosis of VHF, especially after the onset of the acute clinical phase. [(6).]

Differentiating VHF from other tropical illnesses is crucial for executing isolation and infection control measures to mitigate VHF transmission, as well as for administering suitable therapy for VHF and any concomitant infections [7].

Methods and Materials:

2.1 .Design: Quasi-experimental study two groups pretest and post test

2.2 Sample and sample procedure: Nurses with work in the emergency, ICU, internal medicine wards and surgical wards will fulfil the study's inclusion criteria at Al Sadder Teaching Hospital . Sampling technique: A non-probability purposive sampling technique was used for the participants willing to participate Al Sadder Teaching Hospital.

2.3 Setting:

Al Sadder Teaching Hospital. The sample size was calculated using Krejcie, and Morgan (1970) introduced an alternative formula for computing sample size for categorical data. The estimated sample size was 100 samples.

2.4 Ethical consideration:

The study was conducted after approval by the University of Baghdad's College of Nursing's Research Ethics Committee on 7/5/2024. The research approach used in this study was qualitative evaluative. The study protocol and informed consent forms were approved by June. The study was executed according to the ethical guidelines .

2.5 Data collection:

Data collection before and after the interventions using a questionnaire self-report. The investigator started the educational program after the pretest lasted 30-45 minutes for the first day

periods. The knowledge score was evaluated using a questionnaire before and after the intervention program .

2.6 Education intervention:

This program consists of 4 lectures that include an overview about hemorrhagic fever, all families of hemorrhagic fever (Arenaviridae, Bunyaviridae, Filoviridae, and Flaviviridae), signs and symptoms, pathophysiology, diagnosis, prehospital care, treatment, and how to prevent hemorrhagic fever, infection control, and nursing interventions. This program lasted two months. The program included a prephase to assess the level of knowledge, an intervention phase (education program), and a postphase (post-test) to assess the effectiveness of the intervention program.

Validity of the Educational Curriculum and Survey Instrument

A panel of 14 experts evaluated the content validity of the instructional program and multiple-choice questions about the protection of nurses against hemorrhagic fever. These specialists have more than a decade of professional expertise in their respective domains and were precisely analysing the substance of the enquiries and educational curriculum.

Instrumental Reliability Analysis (Internal Consistency) (N=5) (Table 2-1)

The questionnaire domains	No. of Items	Cronbach`s alpha	Evaluation of Internal Consistency
first domain	51	0.83	Good

An acceptable degree of internal consistency and similar measurability was proven by the questionnaires, as indicated by the Cronbach's Alpha analysis in this table, which provides a favourable rating for the knowledge scale at 0.87.

Rating and scoring

The overall knowledge score was calculated by determining the range score based on the mean of the total score. The range was

calculated by determining the difference between the minimum and maximum scores. The range score was subsequently classified into three levels and assigned scores accordingly. The knowledge levels for each item are categorized as follows:
Poor = 0 – 0.33, Moderate = 0.34 – 0.66, and High = 0.67 – 1.

Data analysis

Statistical data were analyzed using SPSS Statistics, version 26. Descriptive statistics were presented through the mean, standard deviation, median, and range. Inferential statistics employed chi-square tests, t-tests, ranked , and point biserial coefficient

4. Results:

Regarding (table 1) The study group comprised an equal percentage of male and female nurses (50%), whereas the control group exhibited a higher proportion of females (52%) compared to males (48%). The study group comprised 40% single nurses and 60% married nurses, whereas the control group consisted of 36% single nurses and 64% married nurses. The study group comprised emergency (24%), ICU (30%), internal medicine (28%), and surgical ward (18%), whereas the control group consisted of emergency (28%), ICU (28%), internal medicine (20%), and surgical ward (24%). The study group comprised nurses with a bachelor's degree (48%) and those from the Institute of Nursing (52%), whereas the control group consisted of nurses with a bachelor's degree (52%) and those from the Institute of Nursing (48%). The study group exhibited a higher proportion of nurses with 3-6 years of experience at 48%, in contrast to the control group, which had 58%.

Regarding tables (2, 3), most nurses demonstrated poor knowledge in the pretest for study and control groups, but after participating in the educational program, their knowledge improved to a high level for the study group. This indicates the effectiveness of the educational program on nurses' knowledge.

Tables 4 and 5 indicate that the pretest results revealed no significant difference between the study and control groups. The post-test results demonstrate a significant disparity in knowledge between the study and control groups.

Table (6) reveals no significant correlation between demographic data and nurses' knowledge.

Table 1: Frequency distribution of the demographic characteristics among the studied sample (n=100)

		Study		Control		
		F	P	F	P	Sig.
Age	18-less than 26	13	26.0	6	12.0	Chi-square=15.581 Df = 16 P – Value = .413 NS
	26-less than 34	15	30.0	21	42.0	
	34-less than 42	11	22.0	10	20.0	
	42-less than 60	6	12.0	9	18.0	
	>50	5	10.0	4	8.0	
	Total	50	100.0	50	100.0	
		M = 34.0 Sd = 8.216		M = 35.44 Sd = 9.725		
Gender	Male	25	50.0	24	48.0	Chi-square=0 Df = 1 P – Value = 1 NS
	Female	25	50.0	26	52.0	
	Total	50	100.0	50	100.0	
Marital status	Single	20	40.0	18	36.0	Chi-square=0.982 Df = 1 P – Value = .470 NS
	Married	30	60.0	32	64.0	
	Total	50	100.0	50	100.0	
Name of ward/department	Emergency	12	24.0	14	28.0	Chi-square=8.543 Df = 9 P – Value = .480 NS
	ICU	15	30.0	14	28.0	
	Internal Medicine	14	28.0	10	20.0	
	surgical ward	9	18.0	12	24.0	
	Total	50	100.0	50	100.0	
Academic qualification	Bachelor	24	48.0	26	52.0	Chi-square=.742 Df = 1 P – Value = .389 NS
	Institute of Nursing	26	52.0	24	48.0	
	Total	50	100.0	50	100.0	
Work experiences (in years)	<3	11	22.0	11	22.0	Chi-square=3.078 Df = 4 P – Value = .545 NS
	3- less than 6	24	48.0	29	58.0	
	>6	15	30.0	10	20.0	
	Total	50	100.0	50	100.0	

		M = 4.74 Sd = 1.126		**M = 4.44 Sd = 1.039**		

Table 2: Assessment nurses' knowledge about hemorrhagic fever pretest for study and control groups

	Study Group			Control Group		
Variable	Mean	Std. Deviation	Ass.	Mean	Std. Deviation	Ass.
1	0.18	0.388	P	0.30	0.463	P
2	0.24	0.431	P	0.22	0.418	P
3	0.18	0.388	P	0.22	0.418	P
4	0.18	0.388	P	0.18	0.388	P
5	0.16	0.370	P	0.28	0.454	P
6	0.16	0.370	P	0.26	0.443	P
7	0.30	0.463	P	0.24	0.431	P
8	0.18	0.388	P	0.24	0.431	P
9	0.22	0.418	P	0.16	0.370	P
10	0.18	0.388	P	0.18	0.388	P
11	0.16	0.370	P	0.22	0.418	P
12	0.12	0.328	P	0.20	0.404	P
13	0.22	0.418	P	0.18	0.388	P
14	0.16	0.370	P	0.22	0.418	P
15	0.26	0.443	P	0.18	0.388	P
16	0.20	0.404	P	0.22	0.418	P
17	0.18	0.388	P	0.20	0.404	P
18	0.20	0.404	P	0.16	0.370	P
19	0.16	0.370	P	0.22	0.418	P
20	0.24	0.431	P	0.20	0.404	P
21	0.14	0.351	P	0.22	0.418	P
22	0.20	0.404	P	0.20	0.404	P
23	0.26	0.443	P	0.18	0.388	P
24	0.20	0.404	P	0.22	0.418	P
25	0.24	0.431	P	0.28	0.454	P
26	0.20	0.404	P	0.20	0.404	P
27	0.26	0.443	P	0.18	0.388	P
28	0.20	0.404	P	0.24	0.431	P
29	0.24	0.431	P	0.26	0.443	P
30	0.20	0.404	P	0.22	0.418	P
31	0.14	0.351	P	0.20	0.404	P
32	0.26	0.443	P	0.24	0.431	P
33	0.18	0.388	P	0.22	0.418	P
34	0.22	0.418	P	0.14	0.351	P

35	0.20	0.404	P	0.22	0.418	P
36	0.20	0.404	P	0.22	0.418	P
37	0.26	0.443	P	0.18	0.388	P
38	0.20	0.404	P	0.26	0.443	P
39	0.24	0.431	P	0.14	0.351	P
40	0.18	0.388	P	0.24	0.431	P
41	0.20	0.404	P	0.16	0.370	P
42	0.20	0.404	P	0.14	0.351	P
43	0.26	0.443	P	0.14	0.351	P
44	0.26	0.443	P	0.24	0.431	P
45	0.26	0.443	P	0.12	0.328	P
46	0.30	0.463	P	0.18	0.388	P
47	0.28	0.454	P	0.20	0.404	P
48	0.26	0.443	P	0.16	0.370	P
49	0.22	0.418	P	0.24	0.431	P
50	0.26	0.443	P	0.24	0.431	P
51	0.30	0.463	P	0.24	0.431	P

Table 3: Assessment nurses' knowledge about hemorrhagic fever posttest for study and control groups

	Study Group			**Control Group**		
Variable	**Mean**	**Std. Deviation**	**Ass.**	**Mean**	**Std. Deviation**	**Ass.**
1	**0.72**	**0.454**	**H**	**0.62**	**0.490**	**M**
2	**0.72**	**0.454**	**H**	**0.58**	**0.499**	**M**
3	**0.78**	**0.418**	**H**	**0.58**	**0.499**	**M**
4	**0.72**	**0.454**	**H**	**0.62**	**0.490**	**M**
5	**0.78**	**0.418**	**H**	**0.60**	**0.495**	**M**
6	**0.72**	**0.454**	**H**	**0.60**	**0.495**	**M**
7	**0.86**	**0.351**	**H**	**0.62**	**0.490**	**M**
8	**0.76**	**0.431**	**H**	**0.56**	**0.501**	**M**
9	**0.68**	**0.471**	**H**	**0.64**	**0.485**	**M**
10	**0.76**	**0.431**	**H**	**0.58**	**0.499**	**M**
11	**0.78**	**0.418**	**H**	**0.56**	**0.501**	**M**
12	**0.72**	**0.454**	**H**	**0.62**	**0.490**	**M**
13	**0.76**	**0.431**	**H**	**0.58**	**0.499**	**M**
14	**0.80**	**0.404**	**H**	**0.54**	**0.503**	**M**
15	**0.76**	**0.431**	**H**	**0.52**	**0.505**	**M**
16	**0.72**	**0.454**	**H**	**0.50**	**0.505**	**M**
17	**0.82**	**0.388**	**H**	**0.54**	**0.503**	**M**
18	**0.74**	**0.443**	**H**	**0.46**	**0.503**	**M**
19	**0.76**	**0.431**	**H**	**0.58**	**0.499**	**M**
20	**0.76**	**0.431**	**H**	**0.56**	**0.501**	**M**
21	**0.76**	**0.431**	**H**	**0.52**	**0.505**	**M**

22	0.78	0.418	H	0.50	0.505	M
23	0.78	0.418	H	0.48	0.505	M
24	0.76	0.431	H	0.52	0.505	M
25	0.82	0.388	H	0.50	0.505	M
26	0.72	0.454	H	0.56	0.501	M
27	0.70	0.463	H	0.50	0.505	M
28	0.80	0.404	H	0.48	0.505	M
29	0.68	0.471	H	0.54	0.503	M
30	0.70	0.463	H	0.46	0.503	M
31	0.68	0.471	H	0.48	0.505	M
32	0.72	0.454	H	0.48	0.505	M
33	0.76	0.431	H	0.48	0.505	M
34	0.74	0.443	H	0.52	0.505	M
35	0.86	0.351	H	0.48	0.505	M
36	0.76	0.431	H	0.44	0.501	M
37	0.68	0.471	H	0.46	0.503	M
38	0.74	0.443	H	0.52	0.505	M
39	0.80	0.404	H	0.50	0.505	M
40	0.74	0.443	H	0.54	0.503	M
41	0.66	0.479	M	0.58	0.499	M
42	0.80	0.404	H	0.54	0.503	M
43	0.78	0.418	H	0.52	0.505	M
44	0.76	0.431	H	0.62	0.490	M
45	0.72	0.454	H	0.58	0.499	M
46	0.80	0.404	H	0.62	0.490	M
47	0.70	0.463	H	0.62	0.490	M
48	0.76	0.431	H	0.54	0.503	M
49	0.68	0.471	H	0.60	0.495	M
50	0.74	0.443	H	0.58	0.499	M
51	0.84	0.370	H	0.64	0.485	M

Table 4: Comparison between study and control groups regarding nurses' knowledge for pre-test (N = 100)

Variables	Groups	Mean	SD	T-test	Df	P-value	Sig
Knowledge about viral hemorrhagic fever	Study	10.9000	2.53345	0.632	48	0.530	NS
	Control	10.6000	2.75533				

Table 5: Comparison between study and control groups regarding nurses' knowledge domain for post-test (N = 100)

Variables	Groups	Mean	SD	T-test	Df	P-value	Sig
Knowledge about	Study	38.3400	3.30497	11.535	48	0.000	HS

viral hemorrhagic fever	**Control**	**11.7200**	**4.18932**				

Table 6: Relationship between socio-demographic characteristics and total nurses' knowledge level for study and control groups post-test (N=100)

Demographic Variables		Knowledge about viral hemorrhagic fever
Age	**r(PB)**	0.002
	P-value	0.987
	Sig	**NS**
Gender	**r(RB)**	0.031
	P-value	0.833
	Sig	**NS**
Marital State	**r(RB)**	0.035
	P-value	0.810
	Sig	**NS**
Name of ward/ Department	**r(RB)**	0.048
	P-value	0.739
	Sig	**NS**
Academic qualification	**r(RB)**	0.014
	P-value	0.922
	Sig	**NS**
Work experiences in years	**r(PB)**	-0.012
	P-value	0.936
	Sig	**NS**

Discussion

Regarding demographic data, The results of this study showed that the majority of participants are from the middle age group. Nevertheless, the study's results were consistent with Hassan, Majeed, and Isam, with a mostly within the age range of 26 to 30

years [8]. This finding agree with Nashwan et al they report majority of healthcare 20-30 years [25].

The majority of the sample in this study was equal between male and female, with percentage (50%).The results were similar to those of Al-Mayahi, Al-Jubouri, and Jaafar. Nearly half of the participants were male (51.4%), while slightly fewer were female (48.6%).[٩]

According to the study's findings, regarding marital status, three-quarters of the study group were married,On the other hand, the study found similar results to those of Ubaid and Al-Jubouri in that three-quarters of the participants were married[١٠] .

Overall, the emergency and ICU made up more than a quarter of the survey participants, as revealed by the name of the ward/department. The results were similar to those of Bakey. Almost half of the participants were nursing college graduates[١١] .

The study results agree with Alwatifi and Hattab; their educational level, 40.8%, had a bachelor's degree in nursing [١٢]

Concerning work experiences (in years), most of the study sample were (3- less than 6), which constituted half of the sample. Similar results were reported by [13] which Findings indicated that half of the participants in the study between (4-6) years**.**

Regarding nurses' knowledge about hemorrhagic fever before an educational program, the study participants reported that they had poor knowledge before the program for the study and control group. This result is consistent with a study conducted by Merbawani , and Munfadlila, who had poor knowledge before the education program[14].

Concerning nurses' knowledge before the program for two groups, most of the study sample had poor knowledge. Similar results were reported by Rehman , Ghani and Rehman, who showed poor knowledge before the training session[١٥] .

However, this finding was consistent with the study conducted by Ayed et al. [14], who found that about half of the respondents were found to have a fair level of knowledge.

Regarding nurses' knowledge about hemorrhagic fever after the education program was high knowledge, similarly to According to a

study carried out by Rehman, Ghani, and Rehman (2020), after the training session, 88% of subjects had very good knowledge [١٥]. Yes, according to 72.7 percent of participants in the Merbawani and Munfadlila (2023) study, they had good knowledge after being given health education [16].

This finding aligns with another study that evaluated the impact of an educational program on infection control precautions, demonstrating an increase in nurses' knowledge mean scores from 21.7% prior to the program to 75% following its completion [17] .This finding aligns with a study that demonstrated a significant improvement in nurses' knowledge scores following the educational program[18].

The result of the study supported by Jaafar and Abed shows the current educational program is effective and can improve nurses' knowledge in critical care units [19].

This study, supported by Falih and Jasim, showed that critical care unit nurses' expertise was enhanced via interventional programs [20].

Regarding the study results, Athb and Mohammed found that the education program effectively improved the participants' nurses' knowledge, which supported the study's findings [21].

concerning the study results showed similar findings to those conducted by Abbas and Atiyah indicating a notable enhancement in nurses' practices concerning the utilization of personal protective equipment. A significant difference was observed in the entire study sample between pre- and post-test practices. [22].

The results of the study agree with those of Kadhim, Abed, and Hattab, who found that the training sessions nurses used had different effects on patients during the post-anesthesia care phase [23].

The results indicated no statistically significant relationships between demographic data and nurses' knowledge. The findings corroborate those of (24), which indicated no significant relationships between nurses' practices and their gender, education level, or years of experience in hemodialysis units. However, a significant relationship was identified between nurses' practices and their marital status.

Conclusion:

The research found that nurses' knowledge improved after the educational program.

Recommendations:

The study recommended the implementation of educational programs for nurses in another city in Iraq, as well as the improvement of preventive measures against hemorrhagic fever. Conversely, the study suggested raising awareness of hemorrhagic fever among students through college lectures, the general public through social media, and other health workers through educational programs.

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Conflicts of interest

There are no conflicts of interest.

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