



Effectiveness of an Educational Program on Nannies' Practice Regarding Cholera Infection in the Nurseries



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ABSTRACT

Aims In nurseries, hygiene measures are considered as an effective practice to prevent infection. By implementing appropriate hygiene techniques and effective prevention measures, the transmission of infectious diseases such as cholera among children and youth can be limited. The present study aimed to assess the effectiveness of an educational program on nannies' practice regarding cholera infection and explore any relationship between their practice and demographic characteristics.

Materials & Methods This quasi-experimental study was conducted with a pre-test and post-test design with a control group in public nurseries in different cities of Baghdad province. Sixty nannies were randomly selected and divided into two equal intervention and control groups. The intervention group received the cholera education program, and the control group did not receive any intervention. Data were collected using a researcher-made checklist to evaluate nannies' practice and analyzed by SPSS 26 software.

Findings Both groups had inadequate practice regarding cholera infection (0.96 ± 0.31 and 1.00 ± 0.15 , respectively). After the implementation of the program, the practice of the intervention group improved significantly (1.59 ± 0.13), while the practice of the control group remained inadequate (1.00 ± 0.12). There was no significant difference in the mean scores of nanny's practice based on their demographic characteristics ($p > 0.05$), except for the level of education ($p = 0.0001$).

Conclusion The practice of nannies in public nurseries in Baghdad against cholera is limited, and the educational program of this study has a positive effect on the practice of nannies. The educational qualification of nannies plays a significant role in responding to the program.

Keywords Cholera; Pediatric Nurse; Nurseries; Training Programs; Preschool Children

CITATION LINKS

[1] The global burden of ... [2] Cholera [3] The treatment of cholera: clinical science at ... [4] Nursing research: methods and critical ... [5] Global cholera epidemiology: opportunities to reduce the burden ... [6] Cholera prevention and control in refugee ... [7] Health-care needs of people affected ... [8] High mortality in a cholera outbreak in western ... [9] Conflict and emerging infectious ... [10] The high burden of cholera in children ... [11] Epidemiology of cholera [12] A stochastic population model of ... [13] Development of a low-cost lateral flow ... [14] Epidemics after natural ... [15] Environmental reservoirs of Vibrio ... [16] Multiple transmission ... [17] Cholera transmission dynamic models for public ... [18] Individual and household risk factors for symptomatic cholera ... [19] Cholera epidemic associated with consumption of unsafe drinking ... [20] A cholera outbreak in Alborz Province, Iran ... [21] Risk factors for household transmission of Vibrio ... [22] Cholera outbreak linked with ... [23] Rapid dipstick detection of Vibrio cholerae in household stored ... [24] Excreta disposal for rural areas and ... [25] Prevalence and causes of Cholera among children ... [26] Rise of cholera in Iraq: a rising ... [27] A flashback to cholera outbreaks in ... [28] Household spraying in cholera outbreaks: Insights from ... [29] Susceptibility to Vibrio cholera infection ... [30] Guidelines on core components of ... [31] Guidance note: Protection of children during ... [32] Knowledge of the audiological effects, symptoms ... [33] Assessment of nurses practice ... [34] Oral health practices and knowledge ... [35] Nannies' knowledge, attitude, and ... [36] Knowledge, attitude, and practice study regarding ... [37] Effectiveness of Education program on health care ... [38] Effectiveness of an education program n ... [39] Effectiveness of an educational program ... [40] Effectiveness of health educational program ... [41] Effectiveness of an instructional program ... [42] The role of motivational interviewing ... [43] Practices of early childhood's mothers ... [44] Effectiveness of an ... [45] Instruction program for patient with peptic ulcer ...

Introduction

Cholera is an acute, potentially life-threatening diarrheal disease caused by intestinal infection with *Vibrio cholerae* serogroups O1 or O139 [1, 2]. Profuse watery diarrhea and vomiting can lead to dehydration and shock. Without treatment, death can occur within hours. Oral and intravenous rehydration therapy has markedly decreased case fatality rates [3]. *Vibrio cholerae* can be found in food or water, so people can get infected after oral ingestion. When *Vibrio cholerae* is ingested, it produces enterotoxins (toxins that act in the gastrointestinal tract) whose actions on the mucosal epithelium are responsible for the characteristic symptoms of cholera, namely, acute watery diarrhoea and vomiting [4].

Cholera is a major public health threat in many parts of the world [5], particularly in areas facing complex emergencies [6]. Cholera outbreaks generally occur when Water, Sanitation and Hygiene (WASH) services are inadequate or compromised [7-9].

Cholera remains a dreaded illness because of its rapid onset, severity, and potential to cause outbreaks that easily overwhelm public health systems in impoverished settings. Seasonal disease occurs in many less developed countries that cannot afford to establish or to maintain essential infrastructure for safe water supply and sanitation. Outbreaks may arise during natural disasters and complex emergencies [10].

Cholera is a disease that reflects social protection levels, availability of clean water, sanitation, and hygiene, as well as population density [11, 12].

In many underdeveloped and low-income countries, cholera, as an ancient disease, continues to be a global health challenge [11]. Cholera infections affect both children and adults who consume water and food contaminated with the bacterium *Vibrio cholerae* [12]. Annually, over 2.8 million people are affected by cholera, resulting in more than 94,000 deaths globally [13]. This burden is disproportionately borne by the young, with children under five having the highest incidence of cholera and contributing almost half of the mortality [1]. This disease may occur as sudden progressive outbreak after a natural disaster, such as a cyclone, flood, and an earthquake. The disruption of the water distribution system and an inadequate hygiene situation or inadequate sanitation system after a natural disaster may cause cholera outbreaks [14].

Diarrhoeal diseases such as cholera are transmitted through the faecal-oral route. Infection with *V. cholerae* can originate from a susceptible person ingesting the bacteria from environmental point sources (e.g., contaminated water in lakes and rivers or a faecal-contaminated environment) [15], which is known as the environment-to-human transmission pathway [16, 17].

Infection with *V. cholerae* can also occur between infected and susceptible individuals [11, 18] from

consuming contaminated food [19-21] or water at the Point of Use (POU) [22, 23] that has been contaminated by a cholera case or through caring for existing cholera cases, particularly among household contacts of a case [18], this is known as the human-to-human transmission pathway.

During outbreaks, recurrent environment-to-human reinfection of the population may also occur through ingestion of *V. cholerae* through contaminated environmental point sources due to sustained contamination of the environment by symptomatic and asymptomatic cholera cases [15]. Both transmission pathways occur through the faecal-oral routes of diarrhoeal disease transmission, commonly known as the F-diagram [24].

It seems that inadequate knowledge of parents to make adequate provision for clean water, clean environment, and decent toilets contributed to its high prevalence among children. Moses et al. [25] observed that many of the victims face a lot health challenges, such as extreme diarrhea, nausea, vomiting, and dehydration. The infected children may lose as much as liter of fluid an hour, nausea and vomiting may last for several hours at a time, and dehydration causes electrolyte imbalance, which can lead to muscle spasms and shock. Hence, victims suffer a life-long disability, reduction in life expectancy, and majority of affected individuals hardly survive to adulthood [25].

Cholera has occurred twice in Iraq in the last ten years. The first outbreak was in 2015, resulting in 1,500 cases, while the second outbreak took place in June 2022, with 13 cases reported in Al-Sulaymaniyah City. During 2022, cholera cases were reported in the majority of governorates. However, the highest impact was observed in Kirkuk, Baghdad, and Thi-Qar, with a significant number of confirmed cases [26, 27]. The persistence of the disease can be attributed to low public awareness of cholera transmission and inadequate infection control measures. To curb the pandemic, it is essential to provide adequate health education about cholera and implement effective preventive measures [28].

When young children contract cholera, they are at risk of severe dehydration, which can be life-threatening due to excessive diarrhea. Additionally, cholera in children can lead to serious complications such as electrolyte imbalance that adversely affects the functioning of vital organs. Due to factors like their young age, level of maturity, and ongoing development, children are less likely to follow recommended behavioral and hygienic practices, such as regular hand washing, which help prevent or reduce the risk of infection. Furthermore, their immune system is still developing and are therefore less able to provide adequate protection [11, 29].

Effective control of transmission relies on educating individuals about infection prevention. This entails providing comprehensive instruction on infection control principles and increasing awareness of the

risks and modes of transmission for common pathogens [30].

Nurses play an important role in stopping the spread of infections by educating the community, with a special focus on protecting children. Key aspects of this education include promoting good hygiene practices and cultivating healthy habits, which have been very effective in preventing a variety of infectious diseases. Additionally, nurses are responsible for emphasizing essential measures like regular hand washing and ensuring proper immunization [31]. Therefore, we must prepare a program to prevent the spread of infectious diseases, including cholera, among kindergarten children and to find out the effectiveness of this program. Hence, the present study aimed to assess the effectiveness of an educational program on nannies' practice regarding cholera infection and explore any relationship between their practice and demographic characteristics.

Materials and Methods

This quasi-experimental study was conducted with a pre-test and post-test design with a control group from September 14, 2022 to June 15, 2023 in public nurseries in different cities of Baghdad province, including Haifa Street, Ba'aa, Amriya, Kadhimiya, Salihia, Al-Sulaikh Center, Al Washash, Rahmaniyah, Mahmudiyah, Jadriya, Habibia, and Al Talibia.

Sixty nannies were randomly selected and divided into two equal intervention and control groups. The intervention group received the cholera education program, and the control group did not receive any intervention. Before starting the study, written consent was obtained from each participant.

The program was designed to provide information and training regarding the prevention of cholera infection and consisted of three lectures for three days. Each lecture was about 45 minutes that took place at classroom in the nursery. The first lecture included general information about cholera, methods of transmission, and its risk factors. The second lecture was prepared for awareness of signs and symptoms, complications and diagnosis, as well as the principles of treatment. The last lecture included training on ways to prevent cholera and practices that nannies follow to prevent the disease from occurring.

After obtaining the validity and reliability, the data was collected by an observation checklist to evaluate the nannies' performance. This checklist was made by researchers to evaluate the performance of nannies regarding cholera infection and included 18 items that were scored on a 3-point Likert scale: never = 1, sometimes = 2, always = 3.

A panel of 11 experts, each with at least 10 years of experience in their respective fields, assessed the validity of the questionnaire. The reliability of the tools was determined by conducting a pilot study

using Cronbach's alpha. The level of practice was scored as inadequate, fair, and adequate

The collected data were analyzed using independent t-test and one-way analysis of variance. Data analysis was done by SPSS 26 software.

Findings

The age of the participants ranged from 26 to 54 years. The mean age for the intervention group was 38.43 ± 7.65 years, and for the control group was 36.9 ± 7.12 years.

More than three-quarters of the nannies were married (86.7% for the intervention group and 80% for the control group), while the rest were either widowed or divorced, and a small percentage of them were single. Also, a high percentage of them had children (96.7% for the intervention group and 90.0% for the control group).

Regarding the level of education, 36.6% of the intervention group had an intermediate degree, 23.3% of them had a primary school degree, while 13.0% and 23.4% had a baccalaureate and bachelor's degree, respectively, and 3.3% had a Master's degree. On the other hand, the highest percentage (56.7%) of the control group had an intermediate degree, followed by 20%, 13.3%, and 10% with a primary, bachelor's, and high school degrees, respectively.

In the intervention group, the majority (46.6%) of nannies had experience between 5 and 11 years, followed by 30.0% between 11 and less than 16 years, 16.7% more than 16 years, and 6.7% less than 5 years. In the control group, 46.7% of nurses had 11 to less than 16 years of experience, followed by 36.6%, 10.0%, and 6.7% with 5 to less than 11 years, more than 16 years, and less than 5 years of experience, respectively. All participants had previous experience in childcare and the majority (46.7% in both groups) had gained their experience outside of a nursery setting.

Both intervention and control groups had inadequate practice regarding cholera infection, with mean scores of 0.96 ± 0.31 and 1.00 ± 0.15 , respectively.

After the implementation of the program, the practice of the intervention group improved significantly, with a mean score of 1.59 ± 0.13 , while the practice of the control group remained inadequate, with a mean score of 1.00 ± 0.12 (Table 1).

At the beginning of the study, there was no significant difference between both groups ($p=0.307$). After the implementation of the program, in the intervention group, there was a significant difference between the mean score of nannies' practice compared to the pre-test ($p=0.0001$).

However, no significant difference was observed in the control group ($p=0.423$; Table 2).

There was no significant difference in the mean scores of nannies' practice based on their demographic characteristics ($p>0.05$), except for the level of education ($p=0.0001$; Table 3).

Table 1) Evaluation of nannies' practice regarding cholera for both intervention and control groups during the study period

Items	Pre-test					Post-test				
	Never (%)	Some (%)	Always (%)	Mean±SD	Ev.	Never (%)	Some (%)	Always (%)	Mean±SD	Ev.
1- Washing hands before, during, and after preparing food										
Intervention group	56.7	40.0	3.3	0.47±0.41	L	0	46.7	53.3	1.53±0.50	H
Control group	40.0	60.0	0	0.60±0.49	L	30.0	70.0	0	0.70±0.57	F
2- Washing hands before and after feeding the child										
Intervention group	10.0	73.3	16.7	1.07±0.50	F	13.3	86.7	0	1.87±0.35	H
Control group	43.3	56.7	0	0.57±0.50	L	43.3	56.7	0	0.57±0.52	L
3- Washing hands after using the bathroom										
Intervention group	50.0	50.0	0	1.50±0.49	H	0	0	100	2.00±0.01	H
Control group	63.3	36.7	0	1.37±0.49	H	60.0	40.0	0	1.40±0.51	H
4- Washing hands before and after changing diapers for the child										
Intervention group	6.7	70.0	23.3	1.17±0.32	F	13.3	86.7	0	1.87±0.35	H
Control group	33.3	83.3	13.3	1.10±0.40	F	3.3	90.0	6.7	1.03±0.53	F
Domain 1/ Hand hygiene										
Intervention group	-	-	-	0.84±0.49	F	-	-	-	1.45±0.51	H
Control group	-	-	-	0.91±0.28	F	-	-	-	0.92±0.35	F
5- Separate diaper changing areas from food preparation areas and water sources										
Intervention group	0	20.0	80.0	1.80±0.49	H	0	0	100	2.00±0.001	H
Control group	36.7	63.3	0	1.73±0.41	H	26.7	73.3	0	1.63±0.45	H
6- Cleaning and disinfecting the diaper changing table between each diaper change										
Intervention group	23.3	66.7	10.0	0.87±0.001	F	26.7	73.3	0	1.73±0.45	H
Control group	0	100	0	0.97±0.57	F	3.3	97.7	3	1.00±0.18	F
7- Ensuring that waste container has a foot-tight cover and is lined with a disposable plastic bag.										
Intervention group	66.7	33.3	0	0.33±0.49	L	6.7	56.7	36.7	1.30±0.59	F
Control group	63.3	36.7	0	0.40±0.48	L	60.0	40.0	0	0.37±0.80	L
Domain 2/ Changing diapers										
Intervention group	-	-	-	1.00±0.50	F	-	-	-	1.67±0.45	H
Control group	-	-	-	1.03±0.57	F	-	-	-	1.00±0.28	F
8- Washing all raw fruits and vegetables thoroughly with clean water										
Intervention group	60.0	36.7	3.3	0.43±0.47	L	10.0	50.0	40.0	1.30±0.65	F
Control group	73.3	26.7	0	0.27±0.45	L	70.0	30.0	0	0.30±0.57	L
9- Cleaning and sterilizing all surfaces during food preparation to prevent food contamination										
Intervention group	36.7	53.3	10	0.7±30.30	F	0	36.7	63.3	1.63±0.49	H
Control group	10.0	90.0	0	0.90±0.30	F	10.0	90.0	0	0.90±0.64	F
10- Getting rid of leftover food after the child finishes meals										
Intervention group	73.3	16.7	10.0	0.37±0.43	L	0	23.3	76.7	1.77±0.43	H
Control group	73.3	26.7	0	0.27±0.45	L	76.7	23.3	0	0.23±0.67	L
Domain 3/ Food safety										
Intervention group				0.33±0.43	L				1.56±0.65	H
Control group				0.48±0.27	L				0.47±0.57	L
11- Cleaning and disinfecting toys for children and newborns (pacifiers and teethingers) at least once a day										
Intervention group	30.0	70.0	0	0.70±0.51	F	0	50.0	50.0	1.50±0.51	H
Control group	60.0	40.0	0	0.40±0.49	L	46.7	53.3	0	0.53±0.47	L
12- Disinfection of some furniture and equipment with sterilization solution, then leaving the solution for at least two minutes, then drying it with a clean towel										
Intervention group	73.3	26.7	0	0.27±0.49	L	3.3	36.7	60	1.57±0.57	H
Control group	70.0	30.0	0	0.30±0.47	L	63.3	36.7	0	0.37±0.45	L
13- Sterilize milk bottles by boiling for two minutes each time to ensure no germs										
Intervention group	80.0	20.0	0	0.20±0.25	L	5.3	36.7	58	1.63±0.49	H
Control group	90.0	10.0	0	0.10±0.30	L	93.3	6.7	0	0.07±0.41	L
14- Using any household disinfectant or bleach solution consisting of one part of bleach to 9 parts of water to clean any area that may be contaminated with feces.										
Intervention group	6.7	86.7	6.7	1.00±0.26	F	0	33.3	66.7	1.67±0.48	H
Control group	0	96.7	3.3	1.03±0.18	F	3.3	93.3	3.3	1.00±0.37	F
15- Using rubber gloves when cleaning any room or surface that has come into contact with child feces										
Intervention group	16.7	60.0	23.3	1.07±0.40	F	0	13.3	86.7	1.87±0.35	H
Control group	6.7	80.0	13.3	1.07±0.45	F	3.3	83.3	13.3	1.10±0.64	F
Domain 4/ Sterilization and disinfection										
Intervention group	-	-	-	0.64±0.20	L	-	-	-	1.27±0.57	F
Control group	-	-	-	0.58±0.22	L	-	-	-	0.61±0.45	L
16- Using boiled water to prepare infant formula and baby food										
Intervention group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
Control group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
17- Having a distance between the place of water that is used for preparing food and milk and the place of bathroom										
Intervention group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
Control group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
18- Having a distance between the place of water for preparing food and milk and the place of changing the baby's diaper										
Intervention group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
Control group	0	0	100	2.00±0.001	H	0	0	100	2.00±0.001	H
Domain 5/ The source of the water used										
Intervention group	-	-	-	2.00±0.001	H	-	-	-	2.00±0.001	H
Control group	-	-	-	2.00±0.001	H	-	-	-	2.00±0.001	H

Continue of Table 1 from the last page.

Overall nannies practices									
Intervention group	-	-	-	0.96±0.31	F	-	-	-	1.59±0.13 H
Control group	-	-	-	1.00±0.15	F	-	-	-	1.00±0.12 F

Eva: Evaluation level, L: Low (0-0.66), F: Fair (0.67-1.33), H: High (1.34-2)

Table 2) Comparing the mean scores of nannies' practice in both groups before and after the intervention

Variable	Pre-test	Post-test	t	p
Hand hygiene				
Intervention group	0.84±0.49	1.45±0.51	-2.726-	0.0001
Control group	0.91±0.28	0.92±0.35	-0.219-	0.582
Changing diapers				
Intervention group	1.00±0.50	1.67±0.45	-3.029-	0.001
Control group	1.03±0.57	1.00±0.28	-1.682-	0.093
Food safety				
Intervention group	0.33±0.43	1.56±0.651	-3.158-	0.0001
Control group	0.48±0.27	0.47±0.568	0.521	0.612
Sterilization and disinfection				
Intervention group	0.64±0.20	1.27±0.57	-5.287-	0.0001
Control group	0.58±0.22	0.61±0.45	-2.234-	0.353
The source of the water used				
Intervention group	2.00±0.001	2.00±0.001	-	-
Control group	2.00±0.001	2.00±0.001	-	-
Total				
Intervention group	0.96±0.31	1.59±0.13	-18.052-	0.0001
Control group	1.00±0.15	1.00±0.12	-0.812-	0.423

Table 3) Comparing the mean scores of nannie's practice based on their demographic characteristics

Demographic characteristics	Mean±SD	Statistics	p
Age			
Less than 30 years	1.57±0.03	Cc=0.339	0.067
30 to less than 40 years	1.74±0.13		
40 to less than 50 years	1.77±0.13		
50 years or more	1.78±0.14		
Education level			
Primary	1.63±0.09	F=14.73	0.0001
Intermediate	1.68±0.07		
Secondary	1.73±0.09		
College	1.79±0.06		
Master or PhD	2.00±0.001		
Marital status			
Single	1.78±0.001	F=0.739	0.538
Married	1.75±0.13		
Widow	1.61±0.001		
Divorce	1.64±0.12		
Children number			
No one	1.78±0.001	F=1.863	0.161
One	1.58±0.04		
Two	1.78±0.14		
Three and more	1.70±0.10		
Monthly income			
Less than 300,000 IQ	1.72±0.14	F=3.044	0.092
300,000-600,000 IQ	1.77±0.12		
601,000-900,000	1.79±0.11		
9001,000 and more	1.70±0.13		
Years of experience			
Less than 5 years	1.72±0.24	F=1.174	0.339
5 to less than 11 years	1.71±0.14		
16 years or more	1.72±0.08		
More than 15 years	1.83±0.14		
Perceived concept of monthly income			
Sufficient	1.77±0.001	F=1.134	0.412
Sufficient Sometime	1.78±0.24		
Not sufficient	1.72±0.14		
Source of experience in children care			
Not have	1.83±0.11	F=1.164	0.386
Out the nursery	1.78±0.13		
From the nursery	1.75±0.14		
Place of Nursery			
Kadhimiya	1.57±0.03	F=1.364	0.294
Habibia	1.74±0.13		
Haifa Street (3)	1.77±0.13		
Jadriya	1.78±0.14		
The Baeea (2)	1.72±0.001		

Continue of Table 3 from the last page.

Salihia	1.71±0.14
Al-Sulaikh Center	1.72±0.001
Al Washash	1.83±0.14
Mahmudiyah (2)	1.78±0.001
Al Talibia	1.75±0.13
Amriya	1.61±0.001
Rahmaniyah	1.64±0.12

Discussion

The practice of the nannies about Cholera before the educational program mostly were fair in both groups (intervened and control groups). The researchers suggest that this level of practice is inadequate for prevention and control infectious diseases among children in the nurseries. This inadequate practice can be attributed to many factors; Firstly, the absence of continuing and consistent training programs aimed at educating and enhancing their abilities to carry out their duties; Secondly, no special practical guideline for nannies about children care and how can deal with infectious diseases to prevent spread and complication; Thirdly, the educational qualifications of the nursery staff play a crucial role, as childcare necessitates a considerable level of competence and expertise. Insufficient adherence to proper childcare practices by nannies in nurseries can contribute to a swift transmission of infections among children [32]. Consequently, it is imperative for nannies to possess effective practices aimed at minimizing the spread of infections and safeguarding the health of young children. In fact, every field in child healthcare needs special training, even among healthcare providers [33].

To the best of our knowledge, no studies have been found on the practice of nannies in our society regarding infection control in general, and cholera in particular, and even in other pediatric healthcare contexts. On the other hand, few studies have been done in this field in other societies. In general, there are gaps in knowledge, as well as in practice and management in various aspects of healthcare among nannies [34, 35]. Indeed, public people have little idea how to deal with cholera [36].

After implementing our program, significant improvements have been made in four critical domains of the practical observation checklist: 1) hand hygiene, 2) diaper changing, 3) food safety, and 4) sterilization and disinfection. The observed improvements in nannies' performance are vital for nursery settings, as they directly affect their important role in caring for young children. These improvements encompass several aspects, such as maintaining cleanliness and sterilization of children's tools, ensuring safe use of water, and good management of designated diaper changing areas. By acquiring these advances, nannies help reduce the risk of infection and prevent their transmission in nursery settings.

Educational programs as knowledge or training have a positive role and impact on recipients in various

occupational sectors, especially in health, education, etc. Also, educational programs for the general public, housewives, mothers and even patients in health centers have been successful and important in the development and education of society in various fields of life. For example, a study conducted to determine the effectiveness of a training program on the practice of healthcare workers showed that most participants performed well after the program intervention [37]. Other interventions also improved the practice of nurses and midwives [38, 39]. In addition, the effectiveness of a health education program targeting mothers' child care practices showed that there was a positive statistical significance between pre-test and post-test outcomes [40]. Meanwhile, programs were held for patients with the aim of improving the knowledge and practice of patients, which showed that they improved in practice and self-care after applying the program [41]. In addition, the motivational interviewing program played a role in empowering and motivating dialysis-dependent patients to adhere to treatment, which led to an improvement in their health status [42].

Also, the results of the present study showed that there is no statistically significant difference in the practice of nannies based on their demographic characteristics except their education level. It means that as people increase their level of education, their knowledge and information about different practices will naturally enhance. Conversely, a lower level of education indicates a diminished level of knowledge. The level of education is very important in acquiring accurate knowledge and adopting appropriate practices. For instance, a nanny with a higher educational background will have a greater awareness of knowledge, and this will be evident in the caring practices she employs when caring for young children. These results are consistent with the results of Mohammed & Ali's study, which showed a significant correlation between mothers' practice and their socio-demographic characteristics, especially with their educational background [43]. Also, Ahmed & Hattab, in a study, showed a statistically significant association between the education level of nurses and their practice improvement [44]. In addition, another study showed that there is a significant correlation between the education level of patients and the effectiveness of the educational program [45].

It is suggested that the educational program used in this study be presented to a committee in the Ministry of Health for evaluation and revision, with

the aim of implementing it in all nurseries throughout Iraq.

Conclusion

The practice of nannies in public nurseries in Baghdad against cholera is limited, and the educational program of this study has a positive effect on the practice of nannies. The educational qualification of nannies plays a significant role in responding to the program. In addition, continuing education is important to improve the care of children in nurseries.

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