

Effect of an Interventional Health Education Program on the Knowledge of Caregivers towards Infection Control Measures in Mygoma Orphanage Center

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Abstract:

Background: Infection is a major health problem in orphanage centers and represents a major cause of morbidity and mortality among residents. Health education is an essential component of infection control and should be offered to all children and their caregivers. The aim of current study to evaluate the effect of a health education program about infection control on knowledge of caregivers & infection rates in Mygoma orphanage center.

Materials and Methods: An Intervention study (Quasi-experimental: pre and posttest design for the same group). The study was conducted in Mygoma orphanage center in Khartoum state. The study sample consisted of 92 caregivers and 13 surfaces in the children's rooms. Data were collected using a questionnaire and laboratory investigations. The intervention program included infection control lectures, handouts, posters, and attention to environmental cleaning and disinfection. Compliance with these measures was monitored and recorded. Data were analyzed using Statistical Packages for Social Sciences (SPSS).

Results: show that the overall mean knowledge of the caregivers about managing infectious diseases in child care settings was 0.35 ± 0.36 at pretest increased to 0.81 ± 0.37 at posttest measurement indicates statistically significant difference ($P = 0.01 < 0.05$) after attendance of the program. Also the study revealed that a significant difference was found regarding infection rates between the pretest and posttest ($P < 0.05$).

Conclusion: The educational and environmental infection control program had a significant impact related to the improvement of the caregiver's knowledge and decrease in infection rates post application of the program.

Key words: Health education program, Caregivers, infection control measures, Mygoma, orphanage

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I. Introduction

Infection control program was a protocol in every hospital to stop the spurt of communicable diseases in various health settings. Apparently, programs have been started and extended in other institutions like schools and childcare centers, where they focused in controlling the infection among the specific population¹. Furthermore, the program was also recognized in the community and group homes, where the infection control strategies is very much needed such as overcrowding, food preparation, sewage disposal and other possible health concerns². The Worldwide Orphans Foundation (WWO) and the Wide Horizons for Children (WHFC) introduced a manual for orphans in 2009, containing recommendations in details for inhibiting infection among orphan institutions which includes Hand hygiene, Bathing practices, Diaper changing, Clothing and sleeping equipment, General cleanliness and Other concerns regarding caregivers and staff³. In addition such precautions and guidelines were formulated to help staff and caregivers in providing the necessary attention, care and techniques to totally prevent infection in specific health care setting⁴.

II. Material and Methods

The materials and methods begins by presenting the research design, followed by setting and duration of the study, sample, sample size, data collection technique and tools, phases of the study, validity and reliability of instruments and ethical consideration.

Study design: A Quasi-experimental study: pretest and posttest for the same group.

Study Setting: Mygoma Orphanage center, Khartoum state, Sudan.

Sample: Care givers deal with abandoned children in Mygoma orphanage center during the study period.

Sample size: The recommended sample size given by the total coverage of caregivers (120), but there are 17 refused to be included and 11 were excluded because either they went for a vacation or resigned from their posts. So the total numbers of participants were 92 caregivers.

Data collection technique and tools: Two tools were used to collect the needed data to achieve the aim of the study, they were: questionnaire to assess the caregiver's knowledge regarding managing infectious diseases in child care settings and Bacteriological assessment that included swab for culture and sensitivity from all food tables and diapering tables in the children's rooms and nasal swab for culture and sensitivity for the study population at the time of study before and after the intervention program.

Data analysis: The collected data as pretest and posttest organized, categorized, tabulated using numbers, percentage mean and standard deviation. The statistical package for social sciences (SPSS version 20) and Chi square test were used for analysis.

Phases of the study:

Pre intervention phase: Baseline survey was conducted.

Intervention phase: Started from (June-September, 2016), the education was given through lectures, small group work, demonstration and remonstrations regarding infection prevention and control.

Post Intervention Monitoring: The researcher started a posttest after memory gap six months. She was using the same tools to compare between pre and post intervention program which were conducted to evaluate the effect of the program on respondents.

Ethical Consideration: An official letter was taken from the National Al Ribat University to Mygoma orphanage center administrator for permission to carry out the study. Participants provided verbal consent to participate they have also been assured of confidentiality and of freedom to withdraw without conditions.

III. Result

The results of the present study showed in figures and tables as follow:

Demographic characteristic in the study population:

Most respondents had secondary education at 46.7%; next in rank was primary education at 35.9%, and some were illiterate 5.4% (fig 1).

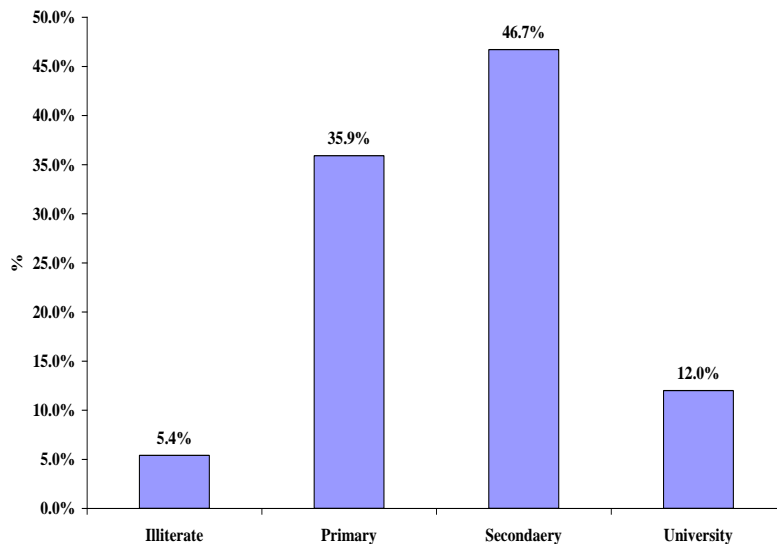


Figure (1): Distribution of the study population according to education (n=92)

More than half the study population worked in this center, for 1-5 years (54.3%), while about one third of the population had an experience of > 1 year (fig 2).

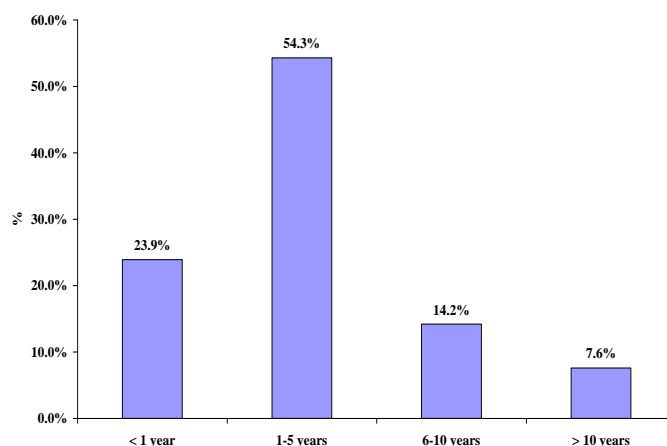


Figure (2): Distribution of the study population according to their Experience in giving care / in the center (n=92)

(Table 1a) shows that the caregivers who attended the workshop regarding “Managing Infectious Diseases in Childcare Settings” have increased their knowledge, compared previously.

Table no 1a: Change of knowledge regarding managing infectious diseases in childcare settings before and after the attendance of the workshop (n=92)

Item	Response			
	Pre		Post	
	Agree	%	Agree	%
1. Viruses should be treated with antibiotics	48	52.2	14	15.2
2. Devices like catheters can also carry bacteria even if the catheter is sterile and good cleaning procedures are followed	48	52.2	78	84.8
3. Children who attend child care are more resistant to infections after their first year of attendance.	78	84.8	88	95.7
4. The most important surface to clean to avoid spread of disease is our hands.	9	9.8	89	96.7
5. Children's immune systems				
a. Get stronger as they are exposed to infectious diseases	15	16.3	80	87.0
b. Get weaker when they are exposed to infectious diseases	40	43.5	7	7.6
c. Are not affected by infectious diseases	37	40.2	5	5.4
6. Mixing children from different groups together when staffing is short spreads infection from group to group.	34	37.0	85	92.4
7. Which of the following is the best answer for how to reduce the number of germs in child care settings?				
a. Circulate fresh outdoor air, use right-size flushing toilets, wash hands, and clean and sanitize surfaces that have been in contact with body fluids	4	4.3	41	44.6
b. Clean and sanitize eating and diaper/underwear changing surfaces before and after each use, wash hands with antibacterial soap, and use germ-killing aerosol sprays to remove odors	40	43.5	18	19.6
b. Clean and sanitize eating and diaper/underwear changing surfaces before and after each use, wash hands with antibacterial soap, and use germ-killing aerosol sprays to remove odors	10	10.9	10	10.9
c. Wear disposable gloves to change diapers; serve and prepare food and clean up blood; and teach everyone to cover their mouths with their hands when they sneeze or cough	30	32.6	20	21.7
d. Quickly remove children who seem sick from the facility and do not allow them to return until they have a note from a health care professional that says they are well	8	8.7	3	3.3
8. Children should be excluded from child care if they (Choose all the answers that apply):				
a. Have a fever	2	2.2	12	13.0
b. Cannot participate in activities	30	32.6	25	27.2

c. Require more care	35	38.0	5	5.4
d. Have a condition that the health department says requires exclusion	8	8.7	0	0.0
e. Have any diarrhea	5	5.4	10	10.9
f.B.C.and D	12	13.0	40	43.5
9.The goal of exclusion is to				
a. Provide a setting where the child can recover y more easily	30	32.6	24	26.1
b. Prevent other children from getting fever	35	38.0	25	27.2
c. Keep certain specific diseases from spreading through the child care site	14	15.2	8	8.7
d. A and C	13	14.1	35	38.0
10.A note from a child's health care professional to return to child care after an illness is not necessary for children who act and feel well	39	42.4	53	57.6
11.To care for an ill child, caregivers should				
a. Adapt activities to the activity level of the ill child	8	8.7	14	15.2
b. Provide extra attention to the ill child	10	10.9	16	17.4
c. Isolate the ill child in the director's office	30	32.6	3	3.3
d.A and B	44	47.8	59	64.1

The mean values of the caregivers on the items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 of the knowledge of the caregivers regarding managing infectious diseases in childcare settings were (0.14±0.35, 0.42±0.50, 0.34±0.36, 0.39±0.11, 0.14±0.35, 0.32±0.27, 0.46±0.50, 0.42±0.15, 0.33±0.34, 0.42±0.50, and 0.49±0.50) respectively at pretest measurement (before attendance of the workshop), and at posttest were (0.52±0.50, 0.84±0.37, 0.99±0.10, 0.85±0.30, 0.87±0.34, 0.78±0.49, 0.94±0.20, 0.73±0.34, 0.78±0.49, 0.84±0.50, and 0.75±0.49) respectively; T values were (-5.86, -4.92, -3.70, -7.04, -14.33, -9.21, -7.39, -8.74, -4.00, -6.19, and -4.90) respectively indicate significant differences between pre and posttest measurements regarding knowledge on all of the 11 items of managing infectious diseases in childcare settings (Table 1b).

Table no 1b: Differences in knowledge of the study population regarding managing infectious diseases in childcare settings before and after attendance of the program in Mygoma Orphanage center 2014-2017 (n=184)

Items	Pre		Post		SE	CI 95%		t	DF	P
	Mean	SD	Mean	SD		Lower	Upper			
(1) Viruses should be treated with antibiotics	0.14	0.35	0.52	0.50	0.06	-0.50	-0.25	-5.86	182	0.011
(2) Devices like catheters can also carry bacteria even if the catheter is sterile and good cleaning procedures are followed	0.42	0.50	0.84	0.37	0.06	-0.45	-0.19	-4.92	182	0.013
(3) Children who attend child care are more resistant to infections after their first year of attendance.	0.34	0.36	0.99	0.10	0.04	-0.22	-0.07	-3.70	182	0.014
(4) The most important surface to clean to avoid spread of disease is our hands.	0.39	0.11	0.85	0.30	0.03	0.83	0.96	-7.04	182	0.001
(5) Children's immune systems a. Get stronger as they are exposed to infectious diseases	0.14	0.35	0.87	0.34	0.05	-0.83	-0.63	-14.33	182	0.001
(6) Mixing children from different groups together when staffing is short spreads infection from group to group.	0.32	0.27	0.78	0.49	0.06	0.42	0.65	-9.21	182	0.001
(7) The best answer for how to reduce the number of germs in child care settings? a. Circulate fresh outdoor air, use right-size flushing toilets, wash hands, and clean and sanitize surfaces that have been in contact with body fluids	0.46	0.50	0.94	0.20	0.06	0.30	0.52	-7.39	182	0.001
(8) Children should be excluded If they f.B.C.and D	0.42	0.15	0.73	0.34	0.04	-0.18	-0.03	-8.74	182	0.001
(9) The goal of exclusion is to d. A and C	0.33	0.34	0.78	0.49	0.06	-0.37	-0.13	-4.00	182	0.013
(10) A note from a child's health care professional to return to child care	0.42	0.50	0.84	0.50	0.07	-0.16	0.13	-6.19	182	0.010

after an illness is not necessary for children who act and feel well.										
(11) To care for an ill child caregivers should	0.49	0.50	0.75	0.49	0.07	-0.28	0.01	-4.90	182	0.012

d.A and B

Availability of essential amenities for infection control according to the response of caregivers is shown in Table no 2. There are many deficiencies in equipment and supplies necessary for infection control.

Table no 2 Infection control amenities (n=92)

		Group			
		Pre (n=92)		Post (n=92)	
		N	%	N	%
1. Are disposable hand towels available in all hand washing basins?	No	92	100.0	24	26.1
	Not satisfactory	0	0.0	68	73.9
2. Is hot& cold running water available at all hand wash sinks?	No	31	33.7	2	2.2
	Not satisfactory	61	66.3	90	97.8
3. Are there foot pedal operated domestic waste bins available for the disposal of paper towels?	No	91	98.9	0	0.0
	Not satisfactory	1	1.1	0	0.0
	Yes, to a great extent	0	0.0	92	100.0
4. Is there a hand washing message /technique poster on display by hand washing area/s?	No	77	83.7	8	8.7
	Not satisfactory	15	16.3	0	0.0
5. Are there separate toilet facilities for staff with separate hand washing facilities?	Yes, to a great extent	0	0.0	84	91.3
	Not satisfactory	92	100.0	92	100.0
6. Are the caregivers nails short, clean, free from nail extensions& polish?	No	26	28.3	12	13.0
	Yes, to a great extent	66	71.7	80	87.0
	Not satisfactory	92	100.0	24	26.1
7. Are hand washing sinks faucet cleaned and disinfected daily?	Yes, to a great extent	0	0.0	68	73.9

Table no 3a: Swabs for culture and sensitivity from surfaces in the children's rooms before and after attendance of the program in Mygoma Orphanage center 2014-2017 (n=26)

		Group			
		Pre (n=13)		Post (n=13)	
		N	%	N	%
Bed handles	No growth	3	23.1	13	100.0
	Staph	8	61.5	0	0.0
	Klebsiella	2	15.4	0	0.0
Food table	No growth	5	38.5	10	76.9
	Staph	3	23.1	2	15.4
	E.coli	1	7.7	0	0.0
	Protus	1	7.7	0	0.0
	Bacillus	1	7.7	0	0.0
	Klebsiella	2	15.4	1	7.7
Diapering table	No growth	3	23.1	10	76.9
	Staph	2	15.4	0	0.0
	E.coli	4	30.7	2	15.4
	Protus	1	7.7	0	0.0
	Klebsiella	2	15.4	1	7.7
	Pseudomonas	1	7.7	0	0.0
Dispenser	No growth	8	61.5	13	100.0
	Staph	2	15.4	0	0.0
	E.coli	1	7.7	0	0.0
	Protus	1	7.7	0	0.0
	Pseudomonas	1	7.7	0	0.0

Datum parts	No growth	2	15.4	8	61.5
	Staph	6	46.2	4	30.8
	E.coli	2	15.4	1	7.7
	Klebsiella	3	23.1	0	0.0

Table no 3b: Chi square test

Significant between pre and post measurements on the side of post measurement

Variables	Chi square	P value
Bed handles	23.12	0.001
Food table	17.02	0.002
Diapering table	19.30	0.001
Dispenser	18.29	0.001
Datum parts	22.11	0.001

Table no 4: shows mother's nasal swabs for culture and sensitivity the isolated organisms were staph, MRSA and klebsiella pneumoniae.

Table no 4: Distribution of the study population according to the mother's culture and sensitivity results

Nasal swab	Group			
	Pre (n=92)		Post (n=92)	
	N	%	N	%
NPOI	78	84.8	83	90.2
Staph	12	13.0	9	9.8
MRSA	1	1.1	0	0.0
Klebsiella pneumoniae	1	1.1	0	0.0
Total	92	100.0	92	100.0

IV. Discussion

It is generally agreed that implementation of infection control program in orphanage center is important in minimizing disease transmission⁵.

In this study results are discussed under four subtitles:

- Demographic characteristic in the study population
- The impact of workshop (Recognizing and preventing Infectious Disease in Child Care Settings) on the knowledge of caregivers
- Infection control amenities
- Bacteriological assessment

Demographic characteristics in the study population:

Demographic data of study group showed the highest percentage of the care givers (46.7%) attained secondary level of education, while the lowest percentage (5.4%) belongs to the illiterate. As experience years most caregivers had between 1-5 years (54.3%) while only more than 10 years (7.6%) (Figures 1 and 2).

The impact of workshop (Recognizing and preventing Infectious Disease in Child Care Settings) on the knowledge of caregivers

It turned obvious that caregivers were not aware of the Germ theory and relation between hygiene and infections. This is why it was difficult to explain to them what is needed to keep themselves and the environment clean. Spread of infection and the use of hand washing and cleansing with Alcohol hand sanitizer was not at all in the mind of many of them. Only few of them know how to reduce the number of germs in child care settings. Also, they did not recognize the importance of isolating infectious children from the rest and they did not know what to do with it. Acceptable knowledge of caregivers regarding managing infectious diseases in childcare settings was found to be higher after attendance of the workshop than before attendance, in all items of the questionnaire (Table1a). In this study, there was significant between pre and post measurements on the side of post measurement (Table1b).

Infection control amenities

The center was not provided with enough numbers of hand washing sinks there is only one sink in each room and this sink used for hand washing, bathing and removing smeared fecal material. No availability of liquid soap (they use just bar soap and sometimes was not available especially during night shift), no temperature monitoring valves to mix tap water, no paper towels, no foot operated domestic waste bins, no poster for hand washing was posted in hand washing area, during and after the intervention program the center was provided by hand washing facilities and each room provided with poster of hand washing. (Table 2)

Bacteriological assessment

- Room investigations

In bed hand the isolated organisms were staph1 61.5% and klebsella 15.4% at pretest investigation, while none of the two were isolated at the posttest measurement. In food table the isolated organisms were staph1 15.4%, E coli 7.7%, Protus 7.7% and klebsella 15.4% at pretest investigation, while at posttest the isolated organisms were staph1 23.1%, and Bacillus 7.7%. In diapering table, the isolated organisms were staph1 15.4%, E coli 15.4%, Protus 7.7% and klebsella 38.5% at pretest investigation, while at posttest measurement the isolated organisms were staph1 23.1%, E coli 30.8%, Pseudomonas 7.7% and klebsella 7.7%. In dispenser the isolated organisms were staph1 15.4%, E coli 7.7%, Protus 7.7%, and Pseudomonas 7.7% at pretest investigation, while at posttest measurement the only isolated organism was Protus 7.7%. In datum parts the isolated organisms were staph1 30.8%, E coli 30.4%, and klebsella 23.1% at pretest investigation, while at posttest measurement the isolated organisms were staph1 46.2% and E coli 23.1% (Table no 3a). In this study, there was significant between pre and post measurements on the side of post measurement (Table no 3b). This was agreed with study from USA showed that there is a decrease in infection rates with the implementation of a comprehensive educational and environmental infection control program in a day care settings⁵.

- Nasal swab for culture and sensitivity for the study population

Results revealed that, the most isolated organisms for mothers' nasal swab in the study were staph 13.0%, followed by MRSA 1.1% and klebsiella pneumoniae 1.1% at pretest investigations while at posttest investigation the only isolated microorganism was Staph 9.8% (Table 4). Results indicate that slight improvement was occurred in nasal swab after culture and sensitivity after attendance of the program and studies done on a similar situation, one study carried out in Finland to evaluate the possibilities for reducing the transmission of infections by an infection prevention program assumed that both the children and the personnel in the program centers had significantly fewer infections than those in the control centers with infection prevention program⁶. Another intervention study was conducted of the City of Helsinki said that prevention of absences due to infections is possible among fewer than 3-year olds by implementing a simple and inexpensive infection control program⁷. More over studies across Australia assumed that there is lower incidence of upper respiratory infections but only among children ≤ 24 months of age⁸ and lower incidence of diarrhea, but only among children < 24 months of age with incidence reduced more in centers with better compliance⁹. Another study carried out in North Carolina about evaluation of a hygienic intervention in child day-care centers said that there is lower incidence of severe diarrhea, but no difference in mild diarrhea, respiratory symptoms, or mixed infections¹⁰.

V. Conclusion

The educational program had a significant impact related to the improvement of the caregiver's knowledge regarding managing infectious diseases in childcare settings and decrease in infection rates in Mygoma orphanage center.

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Declaration of Interest

None.

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