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Effectiveness of an Instructional Program on knowledge and of attitudes regarding environmental cleaning among of housekeeping staffs in AL-Rushfa teaching Hospitals in Bagdad City″

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ABSTRACT

Objective(s): This study aims to determine the effectiveness of the instructional program on housekeeping staff knowledge and attitudes related to environmental cleaning, and to find out the association between the effectiveness of the program with age, gender, level of education, years of service, training session and opinion about the training session

Methodology: A quasi-experimental design, using two groups pre and post-test approach is carried throughout the present study. The study was carried out at Al-Rusafa Teaching Hospitals in Baghdad city for the period from February 2th to March 2th 2020. The study included a non-probability purposive sample of (60) housekeeping staff who are working in Ebn Al. Nafees teaching hospital and Al-Kinndy Teaching Hospital in Baghdad City. That housekeeping staff is divided equally into (30) study and (30) control. The researcher constructed instructional program and instruments in order to reach the aims of this study, the program deals with (6) main parts related to environmental cleaning,Which are (hospital hygiene, waste management, exposure to contaminated fluids and blood, hand washing, sharp and needle injuries, and warnings of infection). A self-administrated questionnaire is constructed for the purpose of the study. It is comprised of (3) parts, the first part deals with the housekeeping staff' socio-demographic characteristics. Part II: housekeeping staff's knowledge about environmental cleaning. Part III: the assessment of the effectiveness of an educational program on the housekeeping staff`s` attitude related to environmental cleaning.
Results The results of the current study revealed that most of the housekeeping staff were male and at age under 30 years old and most of them have primary school graduates. The results revealed that housekeeping staff who participated in instractional program demonstrated a low level of knowledge before the implementation of an instructional program and the level of knowledge improves with a high level after the implementation of an instructional program related to all domains. There is a significant difference in the study group level of knowledge and attitude before and after implementation of the program. There are no significant statistical associations between the level of knowledge and attitude of the study group at the post-test period and their demographic characteristics.

Recommendations: Implementation of the instructional program about the prevention of infection in the hospital and improve the knowledge of housekeeping staff about hospital hygiene and infection control.

***Keywords**: Environmental cleaning; Healthcare-associated infections; Infection control; housekeeping staff, stander precaution*

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INTRODUCTION

Cleaning hospitals were replete with challenges. Roles and responsibilities for cleaning, decisions on what products to use and how to use them, and the cleaning processes are just some of these. Understanding the organizational context into which the bundle was being implemented, as well as understanding the baseline level of knowledge, reported practice, and role of cleaning, supported the tailoring of the Researching Effective Approaches to Cleaning in Hospitals (REACH) intervention at each hospital (Mitchell et al., 2018). Infection control in a health care unit is the prevention of the spread of microorganisms from patient to patient, patient to the staff member, and the staff member of the patient. It is the discipline concerned with preventing the spread of infections within the health care setting and most of the health care institutions have guidelines for infection control (Gray, 2015). Healthcare workers (HCWs) and patients are exposed to a high risk of potential contamination from medical waste by the nature of their work and proximity to this kind of waste, to potentially infected blood, and body fluids that can lead to serious or even lethal infections. This can be minimized by applying standard precautions as hand hygiene, use of personal protective equipment (e.g., gloves, gowns, masks), safe injection practices, safe handling of potentially contaminated equipment or surfaces in the patient environment, and respiratory hygiene/ cough etiquette which are designed to reduce the risk of acquiring occupational infection from both known and unexpected sources in the healthcare setting. (Abukhelaif, 2019; Sarker et al., 2014). Inappropriate medical waste management can lead to injuries from sharp instruments, contamination of the environment by hazardous chemicals, and diseases transmitted by infectious agents. Several major public health threats have been attributable to the poor management of HCW. Effective and efficient management of HCW remains a major problem throughout the world and has been identified as a particular problem in developing countries. Lack of formal training in the management of HCW among hospital staff, and little interest from the hospital administration with regard to the appropriate disposal of HCW (Njagi, et al., 2012).

Methodology

The study design is a quasi-experimental of two groups. The study was carried out to evaluate the effectiveness of the educational program on the knowledge and attitudes of housekeeping staff related to environmental cleaning. The current study was carried in Al-Rusafa Teaching Hospitals in Baghdad between November 5th, 2019 to July 17th2020. These hospitals include Ebn Al. Nafees teaching hospital and Al-Kinndy teaching hospital. The study population includes all housekeeping staff who works at Ebn Al. Nafees teaching hospital and Al-Kinndy teaching hospital in Baghdad City, and includes all age groups and all levels of education. The total population of housekeeping staff who works in selected hospitals (the Ebn Al. Nafees teaching hospital and Al-Kinndy teaching hospital) during the time of the study period and met the study criteria was (110). Ten housekeeping staff in the pilot study was excluded from the study, (10) housekeeping staff refused to participate in this study. The rest (60) housekeeping staff was selected. They are divided into two groups; (30) housekeeping staff as a study group and they are exposed to the educational program and (30) housekeeping staff who are not exposed to the educational program considered as a control group. The instrument was constructed depending on literature reviews and previous studies related to environmental cleaning. It is formatted for the research purpose and composed of three parts;

The first part consists of (5) variables, which include: (age, gender, level of education, years of service, training session and opinion about the training session

The second part is concerned with housekeeping staff knowledge. It is constructed and reviewed by using the most recent and relevant literature. Such as (Motamed,N. et al., 2006; Walle et al., 2013; Aucamp, M. 2016; Ni, K et al., 2017). It consists of (41) items, which covered relevant points from the major content area of the environmental and consist of 7 domains, these domains include the

1. Environmental service and their opinions related to hospital hygiene (7) questions.
2. Waste management (6) questions.
3. Exposure to contaminated fluids and blood (5) questions.
4. Hand washing (4) questions.
5. Sharp and needle injuries (7) questions.
6. Warnings of infection transmission (6) questions.
7. Linens management (6) questions).

The knowledge had been scored and rated on two-level dichotomous scale correct answers and incorrect answer,(2) points for the correct answer, and (1) point for the incorrect answer. Scores of responses are categorized according to the following levels of knowledge (low level of knowledge = (1-1.33), Moderate level of knowledge = (1.34-1.67), and high level of knowledge = (1.68-2.00))

The third part is related to the assessment of the effectiveness of an instaractiional program on the housekeeping staff s attitude related to environmental cleaning. The questionnaire was adapted from studies developed by (Mitchell, B. G et al,., 2018, Anne, et al., 2012) The attitude questionnaire consisted of (18) items consist of (to assess attitudes of housekeeping staff.

The attitude questionnaire has been scored and rated at three levels Likert scale, (3) points for agreeing, (2) points for not certain answer and (1) point of the disagree. Scores of responses are categorized according to the following levels of attitudes (negative level of attitudes = (1-1.66), neutral level of attitudes = (1.67-2.33), and positive level of attitudes= (2.34-3.00). . The reliability of the instrument was determined through the use of the test-retest approach. While the Instrument validity was determined through content validity, by a panel of experts. The statistical analysis

of the data of the study is done by using Microsoft office excel 2010 and SPSS package version. 20. Two statistical approaches were used. A descriptive statistical approach, and an Inferential statistical approach.

RESULTS

Table (1) Distribution and Comparison of the Service Workers (the Control and Study group) According to demographic characteristic

Variable		Control group		Study group		Chi square
		F	%	f	%	
Age	20-25	**11**	**36.7**	5	16.7	X^2=6.86 P=0.076
	26-30	10	33.3	**11**	**36.7**	
	31-35	8	26.7	7	23.3	
	36- 40	1	3.3	7	23.3	
	Total	30	100.0	30	100	
Gender	Female	10	33.3	13	43.3	X^2=0.635 P=0.426
	Male	**20**	**66.7**	**17**	**56.7**	
	Total	30	100.0	30	100	
Educational level	Read and write	3	10.0	9	30.0	X^2=4.23 P=0.121
	Primary	**21**	**70.0**	**18**	**60.0**	
	Intermediate	6	20.0	3	10	
	Total	30	100.0	30	100	
Years of service	1-5	**18**	**60.0**	2	6.7	X^2=20.9 P=0.000
	6-10	11	36.7	**20**	**66.7**	
	11 and more	1	3.3	8	26.7	
	Total	30	100.0	30	100	
Training sessions	Yes	**29**	**96.7**	**29**	**96.7**	X^2=0.00 P=1
	No	1	3.3	1	3.3	
	Total	30	100.0	30	100	
Opinion about training sessions	More than enough	**24**	**80.0**	**24**	**80.0**	X^2=0.00 P=1
	Appropriate	6	20.0	6	20.0	
	Total	30	100.0	30	100	

f=frequency, % =percent

This table shows that 36.7% of the control group at age (20-25) years, (66.7%) of them were males, 70% of them had primary school graduate, (60%) had (1-5) years of services in the hospital, 96.7% of them participate in the training session and 80% describe the training session was more than enough. 36.7% of the study group at age (26-30) years, 56.7% of housekeeping staff were males, 60% of housekeeping staff had primary school graduate, 66.7% had (6-10) years of services in the hospital, (96.7%) of the participants in the training session and 80% describe the training session was more than enough. .

Table (2) Comparison of service workers Knowledge related to the environmental cleaning domains in Pre and Posttest for the study and control group

NO.	Nurses Knowledge domains	Periods	Study group n=30	Control group n=30	t- test	P.value	Sig
			Mean ± S.D	Mean± S.D			
1	Environmental cleaning	Pre	8.56±1.25	8.83±1.34	0.796	0.42	NS
		Post	12.46±1.04	8.70±1.34	12.139	0.00	HS
2	Waste management	Pre	7.46±0.93	7.76±0.97	1.217	0.22	NS
		Post	11.26±0.90	7.73±1.01	14.217	0.00	HS
3	Exposure to	Pre	6.13±0.73	6.26±0.73	0.703	0.48	NS

	contaminated fluids and blood	Post	8.30±0.70	6.26±0.73	10.920	0.00	HS
4	Hand washing	Pre	4.83±0.79	5.36±0.61	2.914	0.005	HS
		Post	7.36±0.71	5.20±0.71	11.713	0.00	HS
5	Sharp and needle injuries	Pre	8.86±0.81	9.06±0.82	0.941	0.35	NS
		Post	12.70±0.91	9.06±0.82	16.126	0.00	HS
6	Warnings of infection transmission	Pre	7.13±0.73	7.33±0.80	1.010	0.31	NS
		Post	10.70±0.65	7.26±0.82	17.856	0.00	HS
7	Linens management	Pre	7.17±0.74	7.30±0.75	0.690	0.48	NS
		Post	10.40±1.13	7.23±0.77	12.644	0.00	HS

n: number, SD: standard deviation, t: independent t test, Sig.: Significance, N.S: No-Significant at p>0.05, HS: high Significant at p<0.001.

Table (2) shows that there is no statistically significant difference in the pre-test for all domains (environmental cleaning, waste management, Exposure to contaminated fluids and blood, sharp and needle injuries, Warnings of infection transmission, and Linens management domains) except hand washing domain indicate a highly statistically significant difference for the study and control group at pretest, at p-value ≤ 0.05 . While there is a highly significant difference in the post-test between study and control group at all domains at p-value ≤ 0.001 .

Table (3) Comparison of service workers Knowledge related to the environmental cleaning domains in Pre and Posttest for the study and control group

NO.	Service workers Knowledge related to the environmental cleaning domains	Group	Service workers Knowledge			
			Pre test n=30	Post test n=30	t- test	P.value& Sig
			Mean ± S.D	Mean± S.D		
1	General environmental cleaning	St	8.56±1.25	12.46±1.04	-14.085	0.00 (HS)
		Co	8.83±1.34	8.70±1.34	2.112	0.043 (S)
2	Waste management	St	7.46±0.93	11.26±0.90	-14.617	0.000 (HS)
		Co	7.76±.97	7.73±1.01	1	0.326 (NS)
3	Exposure to contaminated fluids and blood	St	6.13±0.73	8.30±0.70	-13.574	0.000 (HS)
		Co	6.26±.73	6.26±.73	o.c	(OC)
4	Hand washing	St	4.83±0.79	7.36±0.71	-12.208	0.000 (HS)
		Co	5.36±.61	5.20±.71	1.980	0.057 (S)
5	Sharp and needle injuries	St	8.86±0.81	12.70±0.91	-19.936	0.000(HS)
		Co	9.06±.82	9.06±.82	(OC)	(OC)
6	Warnings of infection transmission	St	7.13±0.73	10.70±0.65	-17.690	0.000 (HS)
		Co	7.33±.80	7.26±.82	1.439	0.161 (NS)
7	Linens management	St	7.17±0.74	10.40±1.13	-15.200	0.000(HS)
		Co	7.30±.74	7.23±.77	1.439	0.161(NS)

St= study group, Co= Control group, no: number, SD: standard deviation, t: paired t test, Sig.: Significance, S: Significant, N.S: No-Significant at p≤0.05, HS: high Significant at p<0.001, OC: out of the comparison

Table (3) shows that there is a highly statistically significant difference between pre and posttest for the study group for all domains (general environmental cleaning, waste management, exposure to contaminated fluids and blood, hand washing, sharp and needle injuries, warnings of infection transmission, and linens management domains), at p≤ than 0.001. While the control group revealed no statistically significant difference and out of the comparison

between pre and posttest at all domains except (general environmental cleaning and hand washing there is a statistically significant difference at $p \leq 0.05$.

Table (4) Comparison of the service workers` attitude in the study and control group for Pre and Posttest (independent sample t test)

service workers` attitude	Periods	Study group n=30	Control group n=30	t- test	P.value& Sig
		Mean ± S.D	Mean± S.D		
Attitude	Pre	36.03±4.90	36.33±4.56	0.245	0.807 (NS)
	Post	44.8±3.18	35.66±4.77	8.715	0.000 (HS)

Table (4) shows there is no statistically significant difference in the service workers` attitude between the study and control group in pretest at $p \leq 0.05$, while there is a highly statistically significant difference in the service workers` attitude between the study and control group in posttest at $p \leq 0.001$.

Table (5) Comparison between of service workers` attitude in the study and control group for Pre and Posttest

Attitude	Group	Service workers` attitude			
		Pre test n=30	Post test n=30	t- test	P.value& Sig
		Mean ± S.D	Mean± S.D		
Attitude	St	36.03±4.9	44.8±3.18	15.755	0.000 HS
	Co	36.33±4.56	35.66±4.77	4.13	0.000 HS

St= study group, Co= Control group, n: number, SD: standard deviation,

Table (5) shows there a high statistically significant difference in the service workers` attitude between the pre and posttest of the study and the control group at p equal or less than 0.001. Although the highly statistically significant difference in the service workers` attitude between the pre and posttest of the study and the control group, the mean score in the study group was higher than the mean score of the control in the posttest.

Table (6) Association between housekeeping staff` knowledge and attitude with their demographic characteristics of the study group at Posttest

Variables	Post-test knowledge			Post education attitude		
	C.V	P.value	Sig.	C.V	P.value	Sig.
Gender	1.63	0.20	N.S	0.709	0.4	N.S
Age	1.61	0.65	N.S	2.87	0.411	N.S
Educational level	5	0.082	NS	3.91	0.141	.S
Years of service	0.125	4.16	N.S	3.51	0.17	N.S
Training sessions	0.074	0.78	N.S	0.315	0.575	N.S

C.V=computed value by the X^2=chi square, sig= significance, N.S= non-significant

Table (6) shows there is no statistically significant association between housekeeping staff `knowledge and attitude with their demographic characteristics of the study group at Posttest

Discussion

Regarding demographic characteristics of the service workers in the study and control Groups. According to age about one-third of the control group was at age (20-25) years, about one-third of the study group were at age (26-30), which are presented in table (1). This finding is consistent with the outcomes from the study done by (Geberemariyam, et al., 2018) who assess the knowledge and practices of health care workers towards infection prevention and associated factors in healthcare facilities of West Arsi District, in Southeast Ethiopia.Their outcomes announced that (53.2%) of the medicinal services laborer at age (18-29) years.

According to the gender, males in both study and control groups, have the highest percentage, the account was 20 (66.7%), and 17 (56.7%) respectively.

Geberemariyam, et al., (2018) mention that (68.8%) of the sample were males. Likewise, Jemal (2018) found males more than females (56% male and 44% female).Regarding the level of education the present study shows that most of the study and the control group of serves` workers had a primary school graduate, the account was 21 (70.0%), and 18 (60.0%) respectively. And most18 (60.0%) of the control group had (1-5) years of services in the hospital and 20 (66.7 %) of the study group had (6-10) years. This finding agrees with Deress, et al., (2019) they found that the health workers had (1-5) years of services and (69.1%) of the study participants were not provided with proper training, this result did not consist of our finding. Also, Okoh & Saheeb, (2016) found that (55.6%) of the sample had years of services (1-10) years. According to the training session, the result of a present study shows a majority of serving workers in the study and the control group (96.7%) of them participate in a training session and (80%) describe the training session was more than enough.

Effectiveness of the education program on knowledge related to the environmental cleaning domains is clearly observed through the data analysis of specific domains (hospital hygiene, waste management, exposure to contaminated fluids and blood, hand washing, sharp and needle injuries, warnings of infection transmission, linens management) of patient`s knowledge between pre and post-test for the study and control group. A highly statistically significant difference is observed between the study and control group in the post-test at a p-value <0.001 While there are no statistically significant differences between study and control group in the pre-test of all domains of knowledge at p-value <0.05. A highly statistically significant difference is observed between pre to post-test periods for the study group at a p-value <0.001. While there are no statistically significant mean differences concerning health worker knowledge between pre-test and post-test periods for the control group at p-value <0.05.Table (2) (3)

Kumar, et al 2016) found that after (18) months since intervention the mean scores of knowledge differed statistically significantly from baseline and intervention group had statistically significantly better knowledge about health care waste management ($p < 0.001$). Health care and sanitary workers in the intervention group scored statistically significantly higher ($p < 0.001$). Training of health and sanitary workers on health care waste management guidelines was sustainable among the intervention group after 18 months which shows the positive impact of the intervention. It is recommended that the training as intervention be included in the overall policies of the public and private sector hospitals in Pakistan and other similar settings.

Effectiveness of the education program on housekeeping` staff attitude related to environmental cleaning of Control and Study Group at Pretest and Post-test the results revealed the highly statistically significant difference was observed in the post-test of the service workers`attitude in the study group the mean and stander deviation (from 36.03±4.90 pre to 44.8±3.18 post-test, P-value =0.000). As compared with the control group the mean score and stander deviation (from 36.33±4.56 pre to 35.66±4.77 post-test, P-value =0.807). (Table 4).

Although highly statistically significant differences were observed in the pre to post of service workers` attitude for the study and the control group, the mean score of the study group was higher than the control group in post-test (Table 5)

This theme is a similar to that be identified in a study conducted in a Canadian hospital in Arar City, Saudi Arabia, which found that the mean score of attitude was the highest in nurses 6.9 (±1.17) then the technicians 6.8 (±1.6), and the lowest score was found in the nursing assistants 6.2 (±0.56). They recommended applying the multimodal training program addressing providers' knowledge, as well as strategies for emotional and behavioral methods to improve knowledge and change in attitude. (Aledeilah et al., 2018)

This result inconsistent with the study conducted in northwest Ethiopia by Deress, et al (2019) to evaluate the knowledge, attitude, and practices of waste handlers regarding medical waste management that concluded favorable attitude (78.2%) about medical waste management.

Rajbhandari et al., (2018) perform a study to assess the knowledge and attitude of HCWs regarding infection control measures, they found that all respondents showed favorable attitudes to infection control and hand hygiene

The data of the post-education program showed no statistically significant differences have been found between housekeeping staff` knowledge and attitude with the demographic characteristics of the study group (table 6).

The present study of the effectiveness of an educational program on the housekeeping staff` knowledge related to the environmental cleaning was the first one in Iraq and, the researcher did not find research similar as a program to support study

The researcher believes that this result due to that some housekeeping staff was forced to work and get out of school in order to help carry out family affairs and to get a financial income for the and some of them working part-time jobs, which causes them to lose job stability**.**

Conclusions

The study result concluded that the program has the effectiveness of the knowledge level and attitude of housekeeping staff toward environmental cleaning. A highly significant difference in the study group level of knowledge and attitude before and after implementation of the program as compared to the control group. And there is no significant statistical relationship between the level of knowledge and attitude of the study group at the post-test period and their demographic characteristics.

Recommendations

Implementation of the instructional program about the prevention of infection in the hospital and improve the knowledge of housekeeping staff about hospital hygiene and infection control. Training session for the service workers about waste management, management of contaminated fluids and blood, hand washing, sharp and needle injuries, infection transmission, and linen management.

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