Assessment of Preventive Measures Among Health Care Workers Regarding Nosocomial Infections in Kut City Hospitals

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Abstract. The aim is to assess the preventive measures of HCWs and determine the relationship between preventive measures and the demographic characteristics of HCWs. Methods: Cross-sectional study conducted among 500 HCWs in Wasit governorate hospitals. This sample was distributed throughout four hospitals include, AL-Zahra, AL-Karama teaching hospitals, AL-Kut gynecology hospital, and Martyr Fairouz general hospital, for the period of October 15th, 2020, to May 15th, 2021. Through self-report and questionnaires, data were collected and analysed through descriptive and inferential statistics. Results: Findings depict that majority of age groups among those who are 20-29 years old 63.2%, 50.2 were male residence in urban areas, 36.2 were medical assistance, and hold a diploma, work less than 10 years and within adequate training. Finding reveals that the majority of 49.8% were poor preventive measures. There was a significant relationship between preventive measures with age, and years of experience of HCWs. Conclusion: Poor preventive measures towards NIs, more years of experience, and more training the staff help raising professionals' health workers.

Keywords: Health care workers (HCWs), Preventive measures, Nosocomial Infections (NIs).

1 Introduction

Health-care workers are the cornerstone of healthcare systems; a healthy and professional workforce is a must for a healthy community, and this is especially important in times of crisis like the COVID-19 pandemic[1]. Health care workers should also be well-informed about the disease and take precautions to protect themselves and the population as a whole[2]. It is the responsibility and duty of all healthcare workers to prevent healthcare-associated infections, professionals in infection control need evidence-based educational content to decrease HAIs[3]. Therefore, to achieve optimal prevention and control of HAI as a regulatory goal, most hospitals have recognized and reached written measurable standards for preventing this infection[4]. Hand cleaning, adequate personal protective equipment, aseptic procedures to prevent patient exposure to microbes, and the monitoring of sharps, blood spills, linen, and garbage to ensure a safe environment are all standard precautions[5]. According to the Centers for Disease Control and Prevention, universal precautions are a set of precautions designed to avoid pathogen transmission when providing health care[6]. Using personal safety barriers such as gloves can reduce exposure accidents to a great extent[7]. In addition to the use of face masks, goggles,

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overhead caps, and gowns, washing hands after disposing of gloves, not returning needles, sanitary disposal of medical waste, sterilization of surgical tools[8]. Hand hygiene is a simple, easy-to-implement habit and an effective method that can help to reduce the risk of infection[9]. The most important intervention in infection prevention is still washing hands[10].
Hand hygiene is measured by the World Health Organization's five moments of hand hygiene, which include washing hands before touching the patient, before clean/sterile operations, after exposure to the risk of body fluids, after touching the patient, and after touching the patient's area[11]. Health workers should always wear personal protective equipment, such as gowns, gloves, goggles, face shields, surgical masks, cardiopulmonary resuscitation masks, head coverings, respirators, and shoe cover because they establish a physical barrier that protects health workers from meeting contaminated or contagious materials[12], In addition to protect patients and visitors from threats to their health[13]. Therefore, this study amid to assess preventive measurements of HCWs; and determine the relationship between preventive measures and demographic characteristics of HCWs.

2 Methodology

A descriptive cross-sectional study through the use assessment approach and questionnaire items is conducted to explore preventive measures is conducted among 500 healthcare workers selected throughout the use of non-probability sampling approach at four hospitals in kut city divided as follows 135 from AL-Zahra teaching hospital, 125 from AL-Karama teaching hospital, 110 from AL-Kut gynecology obstetric and paediatrics hospital, and 130 from Martyr Fairouz general hospital, to explore preventive measures about nosocomial infections among health care workers. The study was conducted from October 15th2020 to May 15th2021. Data was collected using a questionnaire and self-report technique, A questionnaire was created through a related comprehensive review of the literature, which was used as a data collection tool that included socio-demographic characteristics; and preventive measures composed of (20) items. Data was collected using a questionnaire "self-administrative" health worker. The researcher introduced himself to the participants and explained the purpose of the study to get oral agreement. The questionnaire fills out an answer by the participants (health workers). "Through used SPSS-ver. 24 to analyse and evaluate the study data used descriptive analysis to describe the study variables: frequencies and percentages; and inferential statistic include Chi-square “test.

3 Results and Discussion

3.1 Part I: Socio-Demographic Characteristics

The results of the study appeared that 500 samples who participated in this study their age ranged from 20-29 years old and constituted 63.2% as a high percentage at mean + Sd.=30.18+8.620, while the age<20 years composed the lowest percentage out a total of the study sample, as shown in table 1. These results come due to the increasing number of graduates from medical institutes and colleges in Iraq and their enrolment in the direct job more than before. These findings agreed with the study conducted by Tripura deals with hospital-acquired infection knowledge. Findings depict most of the study participants were from 18 to 25 years age group 70.7% [14].

The distribution of gender in this study composed 50.2% were male and 49.8% were female, due to the male more responses to participants in the study. findings come in the same line with a study conducted in Gondar and deals with health care workers regarding infection prevention. Their findings depict that most of the study participants were male, constituted 50.7% were male[15].

The results that urban residents were predominant, it constituted 96.2% out a total number of the study population, as being the hospitals covered by the study are in urban areas so, the health care workers residents in those areas. These results agree with the findings of a study conducted in the Wasit governorate. Found that most of the study participants 94.7% of health workers in two hospitals were residing in an urban area [16].

The results reveal the distribution of study sample according to specialty, findings depicts that most of the study participants were medical assistant, it constituted 36.2% out the total number. Science specialization was the lowest among the results. Being the specialist was considered the major proportion of staff in a health organization, due to the large number of institutions that graduate from such departments. While in a study that found the highest proportion of health workers in Al-Kut hospital 39.1% were nurses compared to 36.8% of health workers in Al-Karamah teaching hospital were technicians [16].

The results that diploma graduated were more than half of the study sample. It constituted 56.8% of the total number of the study population. While the high diploma is the lowest percentage. The presence of institutes in most of the governorates and the graduation of batches of morning and evening study in large numbers in addition to the presence of several departments and various specialties.

Some previous studies agreed with this result, Okwii, found diploma health care workers constituted 48.9% as a majority. In Middle East hospitals found that most respondents depict to have a diploma which indicates 63.6% [17].In regarding the years of experience, results indicate that 73.4% had less than 10 years as predominant findings. As is most of them find new appointments. Because of new hires and the exploitation of young energies among those with working experience >5 years were about 85 respondents 43.4% in a study conducted in Yemen and assessed the standard precautions and nosocomial infection[18].

The results that most of the study participants work less than 8 hours daily, constituted 88.4% out the total number of the study population due to result indicates that the health workers work in the morning shift, as stated in the study cross-sectional study conducted in northwest Ethiopia deals with Knowledge, attitude, and practice of healthcare professionals regarding infection prevention at Gondar University referral hospital. Their findings depict that working hour among health care workers per day are 8 hours 63.8%[15].

Results indicate that laboratories workers were predominant among the study population, which composed 28.8% of the total number. Because of their large numbers and the diversity of their specialties. While in the study Okwii, stated that 30.7% of the respondents were from the medical ward, 26.1% were from paediatrics, 21.6% from surgery, and 21.6% from accident and emergency[19]. Distribution of the study sample according to the training course, most of them had one session of training and composed 32.2% out the total number. Participation in a training session in Iraq is diminished due to the political and economic limitations and this is controlled by the policy of the minister of health of Iraq. These results matched with a cross-sectional study conducted by Yazie et al., who found that more than half 55.3% of the study participants were untrained, is only 44.7% of them were taken training regarding infection prevention and safety in northwest Ethiopia[15].

Table 1. Descriptive statistics of demographic variables.

Variables	Rating	N=500	%
Age	<20 years old	5	1.0
	20-29 years old	316	63.2
	30-39 years old	121	24.2
	40-49 years old	39	7.8
	50 and older	19	3.8
Gender	Male	251	50.2
	Female	249	49.8
Residences	Urban	481	96.2
	Rural	19	3.8
Specialty	Physician	52	10.4
	Nurse	151	30.2
	Medical technologies	96	19.2
	Medical assistance	181	36.2
	Sciences	20	4.0
Education attainmen	Preparatory	30	6.0
	Diploma	284	56.8
	Bachelors	156	31.2
	Higher diploma	11	2.2
	Master and above	19	3.8
Years of experience	<10 years	367	73.4
	10-20 years	115	23.0
	21-30 years	18	3.6
Work hours	≤8 hours	442	88.4
	>8 hours	58	11.6
Workplace	Emergency department	58	11.6
	Consulting department	84	16.8
	Surgical wards	45	9.0
	Medical wards	53	10.6
	Maternity wards	43	8.6
	Pediatric wards	35	7.0
	Laboratories	144	28.8
Training course	No training	146	29.2
	One session	161	32.2
	Two sessions	108	21.6
	More than two sessions	85	17.0

3.2 Part II: Preventive Measures Towards Nosocomial Infections

The findings presented the overall health care workers' preventive measures toward nosocomial infections in Wasit governorate hospitals. Finding reveals that the majority of 49.8% were poor preventive measures at the low level of mean, due to the lack of monitoring by authorities, in addition to the shortage of medical facilities, we find a great shortage of personal protective equipment in hospitals. On the other hand, most of the training courses are theoretical presentations without practical application**,** Fig.1. show the status**.** Our results are consistent with those of an Iranian study conducted in Yazd, the practice among health care staff was poor,

the negative results were 49% from the total, due to staff deficiency failing health personnel to comply with medical instructions. Our results are consistent with those of an Iranian study conducted in Yazd, the practice among health care staff was poor, the negative results were 49% from the total, due to staff deficiency failing health personnel to comply with medical instructions [20]. Study in Yemen among healthcare workers to assess the preventive measures of nosocomial infections, their results show that over half 53.9% have poor practice and 46.1% of them had a good level practice. The poor practice returns to disparities in their education this result shows that there is a gap between the theoretical and practical aspects, which indicates that it is necessary to link between the theoretical and practical aspects about infection and its control[21]. Also, findings concerning preventive measures for nosocomial infections, found that 33.3% have practiced while 66.7% do not practice preventive measures for nosocomial infection, because of the shortage in availability of medical facilities[22].

At the University of Gondar comprehensive specialized hospital in northwest Ethiopia, most respondents have poor infection control practices 64% when it comes to HAI prevention. This lower result may be due to variations in the study sites' sanitary facilities and logistical requirements for HAI prevention activities. Other factors associated with the good practice were also not positively applied by HCWs, indicating that equipment and materials are inaccessible[23].

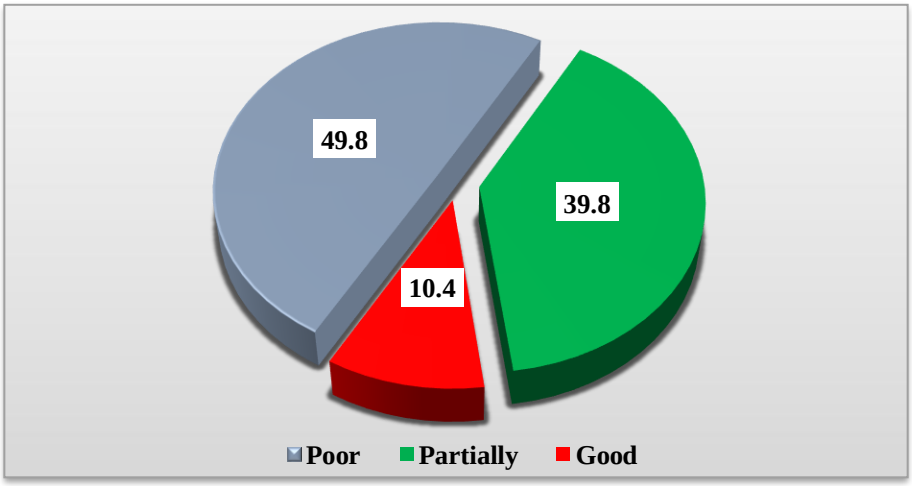

Fig 1. Overall preventive measures towards nosocomial infections.

3.3 Part III: Relationship Between Preventive Measures of Nosocomial Infections and Demographic Characteristics

Findings depict there was no significant relationship between health care workers preventive measures towards nosocomial infections and demographic characteristics at p-value >0.05 (χ^2obs > χ^2cri) except, health workers age and years of experience has been significantly associated at p-value ≤0.05 (χ^2obs < χ^2crit). The strong positive association could be because as the number of years of service increases, healthcare workers are repeatedly exposed to infection prevention principles and became more experienced, Table 2 results showed that the status. Our results are consistent with those of a study conducted in Palestinian hospitals, shows a comparison of mean practice scores about socio-demographic characteristics of the studied

sample. It displays that high mean practice scores were found among those who were in the age group of 20-30 and who attended training courses[24]. It is clear that age is an important factor in infection prevention practice, showing that healthcare staff who are over 30 years of age or older have around twice times to application of infection prevention practices appropriately as opposed to those who are less than 30 years of age this may be due to advanced age and long years of service, which over time leads to improvement in their practices, in addition to age, long work experience, and educational status were significantly associated with infection prevention practice[25]. The practice of preventing hospital-acquired infection is significantly associated with the educational level and work experience of health care staff at (p=0.027 and 0.044 respectively)[23]. Findings from Trinidad and Tobago confirmed that there was no significant association between socio-demographic variables with their practices (p>0.05)[26].

Table 2. The statistical relationship between health care workers' preventive measures and their demographic characteristics.

Variables	Rating	Preventive measures			Total	D.f	*Sig.*	
		Poor	Partially	Good				
Age	<20years old	0	5	0	5	8	χ^2obs.= 37.912 χ^2 crit.= 15.507 P-value=0.000	HS
	20-29years old	163	121	32	316			
	30-39years old	54	49	18	121			
	40-49years old	13	24	2	39			
	50and older	19	0	0	19			
	Total	249	199	52	500			
Gender	Male	129	101	21	251	2	χ^2obs.= 2.286 χ^2 crit.= 5.991 P-value=0.319	NS
	Female	120	98	31	249			
	Total	249	199	52	500			
Residences	Urban	239	193	49	481	2	χ^2obs.= 0.919 χ^2 crit.= 5.991 P-value=0.632	NS
	Rural	10	6	3	19			
	Total	249	199	52	500			
Specialty	Physician	27	20	5	52	8	χ^2obs.= 4.417 χ^2 crit.= 15.507 P-value=0.818	NS
	Nurse	75	58	18	151			
	Medical technologies	47	41	8	96			
	Medical assistance	89	75	17	181			
	Sciences	11	5	4	20			
	Total	249	199	52	500			
Education attainment	Preparatory	15	13	2	30	8	χ^2obs.= 3.749 χ^2 crit.= 15.507 P-value=0.879	NS
	Diploma	143	113	28	284			
	Bachelors	77	63	16	156			
	Higher diploma	5	4	2	11			
	Master and above	9	6	4	19			
	Total	249	199	52	500			
Years of experience	<10years	196	132	39	367	4	χ^2obs.= 11.107 χ^2 crit.= 9.488 P-value=0.025	S
	10-20years	44	58	13	115			
	21-30years	9	9	0	18			
	Total	249	199	52	500			

Work hours	≤8 hours	223	170	49	442	2	χ^2obs.= 3.765 χ^2 crit.= 5.991 P-value=0.152	NS
	>8 hours	26	29	3	58			
	Total	249	199	52	500			
Workplace	Emergency depart.	25	27	6	58	14	χ^2obs.= 12.277 χ^2 crit.= 23.685 P-value=0.584	NS
	Consulting depart.	40	37	7	84			
	Surgical wards	23	14	8	45			
	Medical wards	30	17	6	53			
	ICU	15	16	7	38			
	Maternity wards	21	18	4	43			
	Pediatric wards	21	12	2	35			
	Laboratories	74	58	12	144			
	Total	249	199	52	500			
Training course	No training	76	59	11	146	6	χ^2obs.= 7.619 χ^2 crit.= 12.592 P-value=0.267	NS
	One session	71	72	18	161			
	Two sessions	54	38	16	108			
	More than two	48	30	7	85			
	Total	249	199	52	500			

" χ^2obs. = Chi-square observer, χ^2crit. = Chi-square critical, D.f= Degree of freedom, P-value= Probability value, S= significant, NS= non-significant, S= significant, HS= high significant".

4 Conclusion

This study found that with preventive measures concerning nosocomial infections, health care workers were poor preventive measures due to limitation of training and shortage of health resources. More years of experience and more training the staff on infection control programs by local officials help to raise professionals' health workers preventive measures. As well as, Provide the facilities and exploiting young energies of health staff which indeed help to develop their practice.

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