

Attitudes and Commitment of Healthcare Workers toward Methicillin-resistant *Staphylococcus Aureus* (MRSA) Infections in Hospitals of Thi-Qar Governorate

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Abstract—The nosocomial infection Methicillin-resistant *Staphylococcus aureus* (MRSA) can infect both healthcare workers and patients and have an impact on the standard of treatment offered in hospitals.

The study aims to Identify the relations between the attitudes, and commitment of healthcare workers to prevent methicillin-resistant *S. aureus* (MRSA) and sociodemographic characteristics.

A descriptive cross-sectional study was carried out for 362 healthcare workers randomly chosen from four hospitals and distributed as follows: 125 from Nasiriyah Teaching Hospital, 80 from Al-Hussein Teaching Hospital, 80 from Al-Haboubi Teaching Hospital and 77 from Souk Al-Shuyoukh General Hospital Between October 1, 2022, to May 1, 2023, and data was collected using a self-report paper-based questionnaire.

Our findings indicated that 75.1% of the participants have neutral attitudes concerning MRSA infection. The relationships between attitudes and age, education, marital status, job title, and years of service were statistically significant ($P < 0.05$).

Healthcare workers' commitment were generally moderated. The participant's commitment to MRSA infection prevention was significantly correlated ($P < 0.05$) with their age, education level, job title, and shift time.

So we can conclude that Healthcare workers' attitudes toward the prevention of MRSA infection were neutral while Healthcare workers' commitment to preventing MRSA infection was poor. The study recommended Providing appropriate health facilities and personal protective equipment, Searching for the reasons behind non-compliance of HCWs, and Continual surveillance by medical institution authorities to protect healthcare workers against MRSA infection.

Keywords: Attitudes, Commitment, Health Care Workers.

I. INTRODUCTION

HAIs are believed to be an indicator of how well and how safely patients are being cared for [1]. Humans are affected by the global problem of antimicrobial resistance (AMR), which has grown to be a major obstacle to contemporary medicine [2]. Methicillin was formerly recognized as an antibacterial that was used to treat a variety of illnesses caused by *S. aureus*, but it quickly gained acceptance in medicine and eventually encouraged the development of bacteria strains that were resistant to it [3]. *S. aureus* is a widespread, prevalent bacterial pathogen that infects people and spreads through hospitals and the general public [4].

S. aureus possesses a wide range of virulence factors and the capacity to develop resistance to most antibiotics [3]. According to reports from the Centers for disease control (CDC), MRSA is responsible for 50% of healthcare-associated *Staphylococcal* infections and 1% of all *Staphylococcal* infections [5]. Advanced age, immunodeficiency, hospitalization for a variety of reasons, residing in a facility that offers long-term care, or utilizing an invasive medical device are all significant risk factors for healthcare-associated MRSA infections [6].

Numerous research under consideration revealed that nurses' attitudes toward MRSA and MRSA patients were conflicted [7]. A study conducted at Geneva University Hospitals found that improving hand hygiene compliance can lower MRSA incidence [8]. According to research, Portuguese HCWs had good

views regarding transmission prevention, but these ideas did not convert into actual behaviour [9]. In an Egypt investigation, it was shown that the majority of doctors had a good attitude toward MRSA prevention [10]. When it comes to HCW attitudes, "wanting to prevent MRSA transmission from HCW to patients" and "concern about family members' health, [11]. For (98%) of the nurses in Portugal, maintaining professional hand hygiene was the most crucial step in lowering patient risk [12].

In Indian research, 14% of staff workers reported feeling uncomfortable after repeatedly washing their hands, and 14% conceded to forgetting to do so when working with patients [13]. In a research conducted in Zambia, almost half of the respondents expressed positive attitudes towards Hand Hygiene [14]. Despite the positive attitudes toward Antibiotic Resistance observed among some participants in the study conducted at the Tertiary Care Teaching Hospital in India, this was not significantly reflected in their preventive practices[15].

HCWs can play a crucial role in minimizing MRSA-related HAIs [16]. While healthcare personnel frequently care for patients, their hands, clothing, and equipment may get infected with MRSA [17]. Healthcare systems and organizations must make the prevention of healthcare-associated infections (HAIs) a key priority since they pose a serious threat to the safety of patients and healthcare workers (HCWs) [18]. The majority of healthcare infections are spread by healthcare workers don't wash their hands properly or change their gloves after handling patients [19]. Standard precautions are designed for protecting healthcare workers (HCWs) and stop them from spreading illnesses to their patients [20]. The most important step nowadays in preventing the spread of pathogens in healthcare settings is maintaining adequate hand hygiene [14]. During interaction with MRSA-positive patients, HCWs are mandated to wear a gown, a nose-face mask, a hat, and gloves, per the guidelines [21]. All healthcare workers participating in patient care are obliged to wear a gown and gloves when in the patient's room, while patients under contact precautions are kept in private hospital rooms [22].

II. MATERIALS AND METHODS

A. Study Period:

This study was performed from 1 st October, 2022 to 1 st May 2023.

B Study Design:

A descriptive cross-sectional study to evaluate the attitudes and commitment of healthcare workers to

preventing methicillin-resistant *S. aureus* (MRSA) infection in hospitals in the Thi-Qar Governorate

C. Inclusion Criteria:

Each healthcare worker accepted to participate part in the study, regardless of their employment description.

D. Exclusion Criteria:

Healthcare workers were chosen for the pilot study and those refused to participate in the study.

E. Sample size and Sampling techniques

The simple random method used to select four hospitals in the governorate and its? (AL- Hussein Teaching Hospital, AL- Habboubi Teaching Hospital, and AL- Nasiriyah Teaching Hospital and addition to Suq Al-shuyukh General Hospital in Thi-Qar Governorate's Suq Al-shuyukh District).

The suggested sample size is 362, as determined by Using Steven Thompson's equation as shown below: -

$$n = \frac{N * P(1 - P)}{N - 1 * (d2 \div Z2) + P(1 - P)}$$

n = The minimum sample size

N = Community size 6200

Z = Standard degree=1.96

P = Rate of availability of property=0.50

d = Error ration =0.05 [23]

The numbers of healthcare workers were calculated proportionally for each hospital, by taking the ratio of healthcare workers for a specific hospital to the total number of healthcare workers in all previously chosen hospitals was multiplied by the sample size to determine the proportion of healthcare workers working in each hospital. The head of each department in each hospital provided a list of names of the healthcare workers. Then, using this list, a simple random method was used to choose a sample from each hospital.

F. Data Collection Method:

After receiving all required approvals, data were gathered using a self-report paper-based questionnaire. The purpose of the study was properly explained to the healthcare workers before requesting that they complete the questionnaire, and their consent was obtained. It was then distributed to every employee separately before being collected from the participants. The questionnaire included the following paragraphs:

Section One: Sociodemographic Characteristics of HCWs.

Section Two: This section, which consists of 14 items, discusses the attitudes

Section three: This section, which consists of 12 items, focuses on the commitment of HCWs

G. Statistical Analyses:

A questionnaire was used to gather the data for this study, and the responses were recorded on coded sheets. A computer then entered the data, and the statistical tool SPSS-28 was used to analyze it. Simple frequency, percentage, mean, range (minimum and maximum values), and standard deviation measurements were used to present the data. The significance of the difference in the various percentages (qualitative data) was tested using the Pearson Chi-square test (χ^2 -test). If the P-value had been equal or even less than 0.05, statistical significance was given consideration.

H. Ethical Considerations:

At the start of the data-gathering process, participants' verbal consent was obtained. Participants have been informed of the goal and advantages of the study. They then received an anonymous, self-reported questionnaire. When they gave their consent,

I. Validity

The validity of the questionnaire was evaluated by sharing it with 12 academic experts in the relevant field. Modifications were made based on professional advice for a few items.

J. Reliability

The questionnaires' reliability used in this study was determined by Cronbach's alpha. **Table (1)** shows that the scale has an appropriate degree of internal consistency as evaluated by Cronbach's alpha.

Table (1) Reliability of the questionnaire by Cronbach's alpha.

Indicator	Cronbach's Alpha	Acceptable Value
Attitude side	0.725	0.70
Commitment side	0.802	0.70

The coefficient of stability of the questions varied between 0.725 for attitude as a minimum and 0.802 for Commitment as a maximum, showing that the questionnaire has an excellent level of reliability and can be trusted in the study's field of application, where 0.70 was chosen as the minimal level of stability.

III. RESULTS AND DISCUSSION

The participants' mean age was 29.07 ± 5.71 years, ranging from 21 to 57 years. The age group between 25 and 29 years had the largest percentage (50.8%), while those over 45 years had the lowest rate (2.5%). In this survey, participants were healthcare workers had a slightly female majority of 50.6% compared to a male predominance of 49.4%. Regarding the level of education, 49.4% of healthcare workers possess a diploma, followed by 41.2% of those with a bachelor's degree. For both the preparatory stage and MCs, the rate was 3%, for the PhD, it was 1.9%, and the lowest proportion was for higher diplomas at 1.4%. 48.9% of

healthcare employees were single, compared to 51.1% who were married.

According to the results, medical assistants made up the highest proportion of healthcare workers (21.3%), followed by technical nurses (20.0%), university nurses (18.2%), medical technicians (15.2%), doctors (7.0%), laboratory assistants (6.9%), pharmacists (5.2%), skilled nurses (2.8%), and bacteriologists (1.9%). According to the findings, the majority (66.9%) of healthcare workers have less than five years of experience, while the minority (1.1%) have more than twenty years of experience. The morning shift is where the majority of healthcare workers are employed (74.3%), while 25.7% work the night shift.

In **Figure 1**, the present study report that the highest percentage (75.1%) of HCWs have neutral attitudes, followed by 19.6% of them having positive attitudes, and the lowest percentage (5.2%) of the participants have negative attitudes. While the overall attitudes score of HCWs was 51.39 ± 6.48 which rested within the neutral level of attitudes. These results in health care workers indicate insufficient knowledge about MRSA which is reflected in their attitude towards infection prevention. A study on nurses' attitudes against MRSA conducted at The University of Southern Mississippi indicated that favorable opinions were represented by 31.8%, negative attitudes by 51.3%, and almost neutral attitudes by 16.9%, which is different from what was discovered in this study [7]. Positive attitudes were reported to be present among BSc nursing students in Sri Lanka at Teaching Hospital Karapitiya, with 90.3%, and negative attitudes, with 9.7% [24].

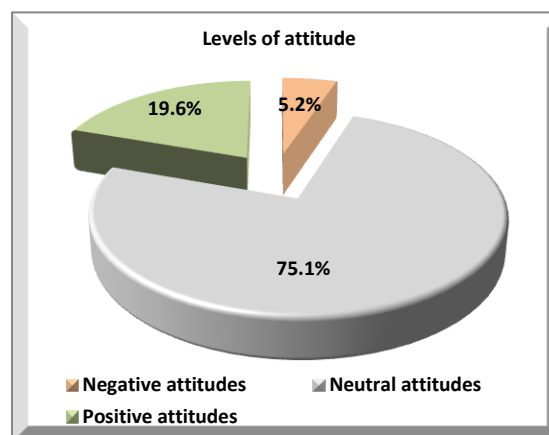


Figure (1): The overall attitudes of the healthcare workers about preventing MRSA infection.

Table (2) represents the association between the total attitudes score and the socio-demographic characteristics of the healthcare workers. The results indicate that there is a significant association between the total attitudes score and the socio-demographic characteristics (age groups, education level, marital status, Job title, and Years of Service) (P. value <0.05).

This explains that healthcare workers age \geq 45 years, and education level (Master and PhD) have a positive level of attitude. This is due to the accumulation of knowledge and its impact on the attitudes of healthcare workers towards MRSA, which are related to the public and family members. Current findings disagree with those of the Palestinian study, which found no significant differences in attitudes between participants' social and demographic characteristics [9]. Also, a Chinese study found that participants with high levels of education had better attitudes and advocated for preventive measures [25]. Another study in Saudi Arabia on nurses agreed with our results, which found

that married couples have better attitudes towards infectious diseases and more avoidance of risky behaviour [26].

The physicians and the healthcare workers have served for more than 20 years have a positive level of attitude compared to other categories. These findings are in agreement with a study on Ethiopian healthcare workers, which discovered a statistically significant relationship between HCW working experience and attitude toward HAI prevention (P value = 0.016) [27]. Moreover, an Iranian study indicated that years of working significantly raised attitude scores (P = 0.032) [28].

Table (2) The association between the total attitudes score and the socio-demographic characteristics of the participants.

		Total Attitudes score						P. value
		Negative attitudes score (<42)		Neutral attitudes (42-56 score)		Positive attitudes (>56 score)		
		No.	%	No.	%	No.	%	
Age groups	<25 years	5	8.2%	38	62.3%	18	29.5%	0.024*
	25-29 years	11	6.0%	147	79.9%	26	14.1%	
	30-34 years	2	3.0%	53	80.3%	11	16.7%	
	35-39 years	1	3.6%	21	75.0%	6	21.4%	
	40-44 years	0	0.0%	9	64.3%	5	35.7%	
	\geq 45 years	0	0.0%	4	44.4%	5	55.6%	
Gender	Male	7	3.9%	131	73.2%	41	22.9%	0.188
	Female	12	6.6%	141	77.0%	30	16.4%	
Education level	Preparatory	0	0.0%	8	72.7%	3	27.3%	0.018*
	Diploma	13	7.3%	136	76.0%	30	16.8%	
	BSc	6	4.0%	115	77.2%	28	18.8%	
	Higher Diploma	0	0.0%	5	100.0%	0	0.0%	
	MCs	0	0.0%	4	36.4%	7	63.6%	
	PHD	0	0.0%	4	57.1%	3	42.9%	
Marital status	Single	14	7.9%	124	70.1%	39	22.0%	0.032*
	Married	5	2.7%	148	80.0%	32	17.3%	
Job title	physician	0	0.0%	15	55.6%	12	44.4%	0.005*
	pharmacist	3	15.8%	11	57.9%	5	26.3%	
	Medical technician	0	0.0%	49	89.1%	6	10.9%	
	Medical assistant	6	7.8%	61	79.2%	10	13.0%	
	Bacteriologist	0	0.0%	4	57.1%	3	42.9%	
	Laboratory Assistant	0	0.0%	18	72.0%	7	28.0%	
	University Nurse	3	4.5%	52	78.8%	11	16.7%	
	Technical Nurse	7	9.2%	55	72.4%	14	18.4%	
	Skilled Nurse	0	0.0%	7	70.0%	3	30.0%	
Years of Service	\leq 5 years	15	6.2%	178	73.6%	49	20.2%	0.007*
	6-10 years	4	4.9%	70	86.4%	7	8.6%	
	11-15 years	0	0.0%	17	68.0%	8	32.0%	
	16-20 years	0	0.0%	6	60.0%	4	40.0%	
	$>$ 20 years	0	0.0%	1	25.0%	3	75.0%	
Shift time	Morning Shift	14	5.2%	203	75.5%	52	19.3%	0.970
	Evening shift	5	5.4%	69	74.2%	19	20.4%	

No= Number; %=Percentage; * = significant; P. value = Probability

Figure (2) represents the overall assessment score of the healthcare workers according to their commitment to preventing MRSA infection, the

present study report that the highest percentage (39.8%) of HCWs have a poor level, followed by 34.8% of them have moderate levels, the lowest

percentage (25.4%) of the participants have good levels. While the overall commitment score of HCWs was 39.68 ± 9.39 which rested within the moderate level of commitment.

This is due to several reasons, including workloads, lack of monitoring by the leaders, and insufficient training that targets MRSA infection. In addition, the training courses lack realistic application in the medical field, as well as poor health facilities and the lack of protective equipment as required.

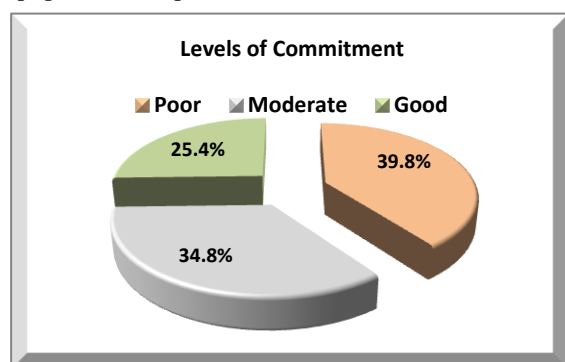


Figure (2): The overall commitment regarding preventing MRSA infection.

The findings of a study conducted in Palestine, which found that only 26% of HCWs had a good level of commitment to preventive measures against MRSA infection, are consistent with the findings of this study. That study's findings indicated poor adherence to preventive measures against MRSA infection [9]. Present findings disagree with those of a US study that found 84.4% of participants adhered to recommended preventive measures against MRSA [16]. While 65% of nurses

in Jordanian research adhered to good levels of infection prevention measures [29].

Table (3) represents the association between the total commitment score and the socio-demographic characteristics of the healthcare workers. The results indicate that there is no significant association between the total commitment score and the sociodemographic characteristics (P. value >0.05), except (age groups, education level, Job title, and Shift time) have a significant association with the total commitment score (P. value <0.05).

The healthcare workers age 40-44 years, and Education level (Higher Diploma) have a good level of commitment. One explanation for this is older and more educated healthcare workers are more committed to precautions due to their better understanding of the danger surrounding them. The findings of the study conducted in Ethiopia showed that Healthcare workers were 31 and older were about twice as likely to implement infection prevention measures as those were between the ages of 21 and 25 [30]. Also, the tendency toward good infection control practices improved as education levels increased from the diploma to the master's level [27]. According to a study conducted in China, it was found There is a significant correlation between job title and prevention strategies [31].

In addition, the part-time HCWs would receive additional education to broaden their knowledge, according to the predictive relationship between full-time employment status and practice adherence [16].

Table (3) The association between the total commitment score and the sociodemographic characteristics of the participants.

		Total Commitment Score						P. value
		Poor (<36 score)		Moderate (36-48 score)		Good (>48 score)		
		No.	%	No.	%	No.	%	
Age groups	<25 years	16	26.2%	31	50.8%	14	23.0%	0.003*
	25-29 years	78	42.4%	58	31.5%	48	26.1%	
	30-34 years	25	37.9%	23	34.8%	18	27.3%	
	35-39 years	18	64.3%	8	28.6%	2	7.1%	
	40-44 years	6	42.9%	1	7.1%	7	50.0%	
	≥ 45 years	1	11.1%	5	55.6%	3	33.3%	
Gender	Male	65	36.3%	69	38.5%	45	25.1%	0.286
	Female	79	43.2%	57	31.1%	47	25.7%	
Education level	Preparatory	6	54.5%	1	9.1%	4	36.4%	0.002*
	Diploma	87	48.6%	53	29.6%	39	21.8%	
	BSc	42	28.2%	63	42.3%	44	29.5%	

	Higher Diploma	3	60.0%	0	0.0%	2	40.0%	
	MCs	6	54.5%	4	36.4%	1	9.1%	
	PHD	0	0.0%	5	71.4%	2	28.6%	
Marital status	Single	63	35.6%	67	37.9%	47	26.6%	0.269
	Married	81	43.8%	59	31.9%	45	24.3%	
Job title	physician	10	37.0%	15	55.6%	2	7.4%	<0.001*
	pharmacist	3	15.8%	13	68.4%	3	15.8%	
	Medical technician	25	45.5%	17	30.9%	13	23.6%	
	Medical assistant	46	59.7%	19	24.7%	12	15.6%	
	Bacteriologist	0	0.0%	5	71.4%	2	28.6%	
	Laboratory Assistant	9	36.0%	11	44.0%	5	20.0%	
	University Nurse	16	24.2%	21	31.8%	29	43.9%	
	Technical nurse	29	38.2%	24	31.6%	23	30.3%	
	Skilled nurse	6	60.0%	1	10.0%	3	30.0%	
Years of Service	<= 5 years	87	36.0%	95	39.3%	60	24.8%	0.055
	6-10 years	37	45.7%	23	28.4%	21	25.9%	
	11-15 years	14	56.0%	6	24.0%	5	20.0%	
	16-20 years	6	60.0%	1	10.0%	3	30.0%	
	>20 years	0	0.0%	1	25.0%	3	75.0%	
Shift time	Morning Shift	96	35.7%	108	40.1%	65	24.2%	0.001*
	Evening shift	48	51.6%	18	19.4%	27	29.0%	

No= Number; % =Percentage; * = significant; P. value = Probability

IV. CONCLUSION

Healthcare workers' attitudes toward the prevention of MRSA infection were neutral and Healthcare workers' commitment to preventing MRSA infection was poor.

The study demonstrated that the participants of old age groups, higher educational levels and job titles had good attitudes, and commitment regarding MRSA.

The study showed that service years and job titles have a significant association with the level of attitudes. The highest percentage of commitment to the prevention of MRSA was the university nurse.

V. RECOMMENDATIONS

1. Providing appropriate health facilities and personal protective equipment is necessary to prevent MRSA infection, which contributes to raising compliance rates.

2. Searching for the reasons behind non-compliance of health care workers with preventive measures and finding appropriate solutions.
3. Continual surveillance by medical institution authorities to protect healthcare workers against MRSA infection.

CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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