

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) TOWARDS  
HEPATITIS B, C AND HIV AMONG SANITARY STAFF AT A TERTIARY CARE  
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Article Received on 26/09/2016

Article Revised on 16/10/2016

Article Accepted on 06/11/2016

**ABSTRACT**

**Background:** Owing to the nature of their work, sanitary workers in healthcare settings are at an increased risk of acquiring blood borne infections. The purpose of this study was to assess the knowledge, attitude and practices of sanitary staff working in a tertiary care hospital in Saudi Arabia towards the two most common infectious diseases (HIV and Hepatitis B,C) that they may acquire while handling hospital waste. **Method:** Using a pre-designed, pre-tested questionnaire this cross-sectional survey was conducted between September 2015 till January 2016. **Results:** The results revealed only 50% of the participants possessed adequate knowledge about HIV and hepatitis (B,C). Slightly more than half had clear idea of blood and body fluids as possible sources of HIV and Hep (B,C) transmission. A high number of participants believed shaking hands, sharing toilets and contaminated water can transmit these infections. Regarding attitudes, majority expressed negative attitudes such as shame and guilt, especially if diagnosed with HIV. In response to practices, >80% participants were not aware of their HIV and Hepatitis screening status. **Conclusion:** The study findings indicated an urgent need to revise the existing training program for sanitary workers in healthcare settings in Saudi Arabia.

**KEYWORDS:** HIV, Hepatitis (B C), Sanitary workers, Knowledge, Attitude, Practices.**1. INTRODUCTION**

Hepatitis (B, C) and HIV are two major public health challenges of the contemporary world affecting millions of people both in resource-rich and resource-constraint countries.<sup>[1,2]</sup> In healthcare settings, one of the key groups at increased risk of acquiring these infections are sanitary workers responsible for cleaning and removal of infectious/biomedical waste in hospitals.<sup>[3,4]</sup> According to the Centre for Disease Control (CDC), approximately 11% of needle stick injuries in healthcare settings occur during disposal-related activities exposing their handlers to more than 20 different types of blood-borne infections.<sup>[3,5]</sup> This incidence can increase further if the staff handling this waste lacks basic knowledge and sensitisation about the diseases they may acquire while disposing-off the hospital waste.<sup>[6]</sup>

Sanitary staff (Staff employed in hospital to clean, collect and dispose-off infectious as well as general waste from inpatient and outpatient departments are collectively referred to as sanitary staff/workers in this study) working in most government hospitals in Saudi Arabia are deployed through private agencies which in

turn recruit them from neighbouring countries such as Bangladesh, India, Pakistan and Ethiopia. Al-Noor Specialist Hospital is one such tertiary care hospital providing healthcare services to residents of Makkah region as well as *Hajj* and *Umrah* pilgrims coming to the Holy City from all around the world. This 500 bedded hospital serves an average of 800-900 patients per day in outpatient department (OPD) and a high number of surgeries are carried out daily ranging from minor to extensive procedures. Sanitary workers in the hospital, once hired, are given training on safe handling and disposal of hospital waste. The primary focus of this training program is to teach basic infection control standards to the sanitary workers including; general information about blood borne diseases, hand hygiene, safe disposal of infectious waste, use of personal protective equipment and effective removal of biological spills in the hospital; thereby enabling them to protect themselves from acquiring blood-borne infections.

However, no baseline survey is ever conducted in the hospital to assess if the given training sessions have resulted in an improvement in the knowledge, attitude

and practices (KAP) of these sanitary workers to protect themselves from blood-borne infections. This study is, therefore, designed to assess KAP of sanitary workers towards the two most common infectious diseases (Hepatitis B, C and HIV) they may be exposed to while handling hospital waste. The aim of this study is to assess the existing knowledge, attitude and practices of sanitary workers in Al-Noor specialist hospital relating to hepatitis (B, C) and HIV. The study findings will enable the Infection Control Department of Al-Noor hospital to get an insight into the effectiveness of current training programme in bringing a positive change in sanitary staff knowledge and behaviours towards hepatitis (B, C) and HIV. The evidence gained will be used to review and further refine the current training strategy for sanitary workers in the hospital.

## 2. MATERIAL AND METHODS

### 2.1. Study design, sampling technique and ethical approval

This cross-sectional survey was conducted from September 2015 to January 2016. The study participants were sanitary staff employed in Al-Noor hospital to clean, collect and dispose-off infectious as well as general waste from outpatient and indoor hospital departments. Ethical approval was obtained from the hospital ethics committee before initiation of the study. Details regarding number of sanitary workers, their nationalities and job location inside the hospital were obtained from the Hospital's Human Resource Department. According to the records there were 542 sanitary workers; out of which 377 were randomly selected to participate in this study. Field team identified for this project consisted of one coordinator and five interviewers. The interviewers were fluent speakers of at-least one of the native languages of the participants that benefitted them in building quick rapport and making participants at ease during the interviews. Before starting the data collection, two workshops were arranged to train the interviewers on effective interviewing techniques, familiarise them with the questionnaire and respond to their queries. Individual interviews were conducted after taking informed consent and at a mutually agreed time and place with the participants.

### 2.2. Survey questionnaire

The questionnaire used in this study was modified from the instrument developed by Noman and colleagues.<sup>[7]</sup> The questionnaire was initially prepared in English language and then translated into Bangla, Urdu/Hindi and Arabic languages by four members of the study team who were native speakers of at-least one of these languages and also fluent in English. To assess the quality of translation the questionnaires were reviewed twice by an independent group of native speakers who also had medical/research background. The questionnaires were then pre-tested and refined to further remove any ambiguity and duplication before use. The questionnaire thus finalised was in four languages

(English, Bangla, Urdu and Arabic) and consisted of nine sections. Keeping in view the Amharic language speakers from Ethiopia had good command of Arabic and Bahasa speakers from Indonesia were fluent in English, the interviews for these participants were conducted in Arabic and English, respectively.

Section one focused on demographic characteristics of the participants and contained 10 questions. Section two consisted of 22 knowledge-related questions about hepatitis (B,C) and further subdivided into three categories with questions relating to i) symptoms, ii) modes of transmission and iii) prevention and treatment. In section three, five questions on attitude towards hepatitis with both positively and negatively framed responses were asked. Likewise, in section four, practices related to hepatitis were assessed through eight questions including on disease screening, vaccination, safe use of sharps, safe blood transfusion and meeting people with the disease. Questions about HIV/AIDS were asked in section five, six and seven. In section five, there were 19 questions to assess knowledge of the participants towards HIV and were sub-categorised as in knowledge section for hepatitis (which are: symptoms; modes of transmission; prevention and treatment). Section six and seven of the questionnaire consisted of five and seven questions, respectively, each to assess attitude and practices of the respondents related to HIV/AIDS with similar themes as for hepatitis. Finally, in section eight and nine, participants were asked about their response to needle stick injury and source of their information about hepatitis (B,C) and HIV, respectively.

For majority of the questions participants were required to choose from "yes", "no" and "don't know" options. However, few questions in sections relating to attitude and response to needle stick injury were multiple choice and participants were expected to select one from a given set of responses.

### 2.3. Scoring of the results

To assess knowledge and practices, each correct response was given a score of 1 while incorrect response and where the participants opted for "don't know" option were scored 0. There were 22 questions for knowledge about hepatitis thus participants score could range between 0 to 22. Similarly, for 19 questions for knowledge about HIV/AIDS participants could score between 0 to 19. For practices, there were eight questions for hepatitis and seven for HIV, thus, minimum and maximum individual scores ranged between 0 to 8 and 0 to 7, respectively. For attitude, there were five questions each for hepatitis and HIV/AIDS. Score 1 was given to each positive and 0 to each negative attitude, with a minimum and maximum score spanning between 0 to 5 for both hepatitis and HIV/AIDS.

Level of knowledge was categorised as adequate for participants who scored  $\geq 50\%$  and inadequate for the participants scoring  $< 50\%$ . Similarly, for attitudes and

practices, participants achieving  $\geq 50\%$  were classified as having positive attitudes and safe practices, respectively and  $< 50\%$  as having negative attitude and risky practices.

#### 2.4. Statistical analysis

The information collected by interview questionnaire was coded into variables. Then both descriptive and inferential statistics were carried out as appropriate using Statistical Package for Social Sciences software (IBM SPSS version 23). In the analysis of each test, a p-value of less than 0.05 was considered statistically significant.

### 3. RESULTS

3.1. Table 1 presents sociodemographic characteristics. Out of 377 randomly selected sanitary workers, 371 consented and participated in the study; giving response rate of 98.4%. Among the study participants, 208 (56.4%) were females and 161 (43.46%) were male. Mean age of the respondents was 31 years (range 18 to 55 years). Overall, 213 (57.4%) participants were from Bangladesh; 93 (25%) from India; 19 (5.1%) from Indonesia; 14 (3.8%) from Pakistan; 12 (3.2%) from Ethiopia; 12 (3.2%) from Saudi Arabia; and 8 (2.1%) from other countries (Philippines and Sri Lanka). About one third (33.2%) of the participants never had any formal education. However, 59 (15.9%) and 159 (42.9%) attended primary and secondary school, respectively. A small number (7.8%) were college or university graduates. According to the nature of their work in the hospital, 255 (68.7%) were cleaners; 45 (12%) messengers; 29 (7.8%) were laundry staff; 25 (6.7%) infectious waste disposal staff while 17 (4.6%) were supervisors. For majority of the respondents (70.5%) Al-Noor hospital was their first job placement while remaining 105 (29.5%) had previously worked in a hospital either inside or outside Saudi Arabia. More than 80% participants never attended any formal training or awareness workshop on HIV or hepatitis and their main sources of information about the two diseases were electronic media, followed by discussions with friends/relatives and print media respectively.

3.2. Knowledge about Hepatitis (B, C) and HIV: Responses of the participants towards knowledge about hepatitis and HIV are summarised in section (i) and (ii) of table 2, respectively.

3.2.1. Knowledge about Hepatitis (B,C): One eighty one participants (48%) scored  $\geq 50\%$  and thus categorised as having adequate knowledge about hepatitis. Almost all the participants (95.6%) had heard of the term Hepatitis, however, only 139 (39.7%) and 110 (32.1%) participants, respectively, knew about hepatitis 'B' and 'C' distinctly. Regarding symptoms, 236 participants (67.6%) responded correctly that a person can get hepatitis at any age, 185 (53%) recognised jaundice as a common symptom of hepatitis and 152 (43.9%) knew that a person with hepatitis can remain symptomless. Overall, knowledge of the respondents about modes of transmission was somewhat better (mean score 56.8%)

than knowledge about how hepatitis cannot be transmitted (mean score 27.96%). As an example, almost 60% of the participants knew that hepatitis can be transmitted through needle stick injuries, surgical instruments and from infected mother to child. Similarly, about 50% of them recognised blood, body fluids, ear/nose piercing, blades of barbers and unsafe sex as other possible modes of transmission of hepatitis B and C. However, when asked about modes through which hepatitis cannot be transmitted, only 67 participants (19%) were able to answer that hepatitis cannot be transmitted through mosquito bite. Likewise, only 88 respondents (25%) had the knowledge that eating in same plate with a patient cannot transmit hepatitis (B,C). Regarding treatment and vaccination, 241 participants (69.7%) were aware of the treatment availability for hepatitis but only 172 (49%) knew about hepatitis B vaccine availability. On bivariate analysis, statistically significant positive linear correlation was found between knowledge about the terms hepatitis 'B' and 'C' and modes of transmission of the disease such as needle stick injury ( $\chi^2$  0.164,  $p= 0.002$ ). Similarly, significant positive correlation was noticed between knowledge about modes of transmission of hepatitis and awareness about treatment availability for hepatitis ( $\chi^2$  0.147,  $p= 0.006$ ) (see table 5, section i).

3.2.2. Knowledge about HIV/AIDS: For HIV/AIDS, 200 (53%) respondents scored  $\geq 50\%$  and therefore exhibited adequate knowledge. Majority ( $>80\%$ ) were familiar with the terms HIV and AIDS. Two fifty three (70.5%) correctly responded that HIV can be acquired at any age. However, only 132 (36%) knew that an HIV positive person can remain symptomless, at least in early stages of the disease. Participants' knowledge about modes of HIV transmission was high and  $>70\%$  accurately identified needle stick injuries, surgical instruments, blood, body fluids and unsafe sex as possible routes through which the virus can be transmitted. A slightly less number, 263, (64%) knew about mother to child transmission of HIV. However, when asked about blades of barbers and ear/nose piercing instruments as viable sources of HIV transmission only about 50% could give correct answer. As for hepatitis, when asked about the modes through which HIV cannot be transmitted only 165 (44%) and 152 (42%) participants respectively knew that the infection cannot be transmitted through handshake or contaminated water. In the same way, only 64 (18%) and 116 (32%) respondents were able to identify mosquito/insect bite and eating in same plate as not the sources of HIV transmission, respectively. As regard treatment availability for HIV, 216 (60%) were aware of it but at the same time only 87 (24%) correctly knew there exists no vaccine for HIV prevention. Bivariate analysis showed that those who knew that "HIV positive people can remain symptomless" have significantly better knowledge about modes of HIV transmission ( $\chi^2$  0.177,  $p= 0.001$ ) as well as treatment availability for HIV ( $\chi^2$  0.159,  $p= 0.003$ ) (see table 5, section ii).

### 3.3. Attitude towards Hepatitis (B,C) and HIV

Attitude of the participants towards hepatitis (B,C) and HIV is summarised in table 3.

3.3.1. Attitude towards Hepatitis (B,C): A total of 264 (70%) participants exhibited an overall positive attitude towards hepatitis (scored  $\geq 50\%$ ). About 269 (76.6%) believed that they can get the disease. However, when asked about their reaction in case they actually got the disease, only 178 (51%) showed a positive attitude while 193 respondents (49%) associated it with shame, surprise and sadness. Similarly, although 300 participants (84%) agreed to share their disease status if they got the infection but when asked with whom they would immediately discuss, only 166 (52%) preferred to talk to their supervisor or staff physician/nurse. In their response towards their major worries if diagnosed with hepatitis 316 (93.5%) chose fear of death, fear of disease spread in family and cost of treatment as their major stressors. Participants showing positive attitude if got the infection were also found more willing to share the information with their physician/nurse. The result is positively correlated and statistically significant ( $\chi^2$  0.132,  $p=0.013$ ) (see table 5, section iii).

3.3.2. Attitude towards HIV/AIDS: For HIV/AIDS, 266 (70.5%) participants scored  $\geq 50\%$  and were categorised as having positive attitude towards the infection. When asked "do you think you can get HIV infection" 265 (73.6%) said "yes". However, on further exploration about their response if they actually got HIV, only half of them, i.e. 200 participants (56.5%) exhibited positive attitude while another 171 (46%) related it with feeling of shame, surprise and sadness. Similarly, while 300 (84%) participants preferred to share the information with someone if found HIV positive, only 167 (47%) opted to talk to their supervisor or physician as first person to share the information with. Finally, when enquired about their major worries if diagnosed with HIV, 322 (91%) expressed fear of death, fear of disease spread in family and cost of treatment as their main worries. Exhibiting positive attitude if got HIV infection is found to be positively correlated with better knowledge about modes of HIV transmission ( $\chi^2$  0.160,  $p=0.003$ ) (see table 5, section iv).

3.4. Practices towards hepatitis (B,C) and HIV: Table 4 demonstrates practices of participants towards hepatitis (B,C) and HIV/AIDS. Overall, 197 (52%) and 213 (56.4%) participants scored  $\geq 50\%$  for hepatitis and HIV respectively and therefore exhibited safe practices.

3.4.1. Practices towards Hepatitis (B,C): Among the respondents, only 62 (17.7%) participants were screened for hepatitis while 235 (67%) stated they were never screened and another 54 (15.4%) were altogether unaware of their screening status. In response to question about hepatitis B vaccination, 84 (24%) confirmed they

were vaccinated, 189 (54%) said they were not and 75 (21.6%) were not sure whether they were vaccinated or not. Participants' responses to other practices such as use of new syringe, screening for blood transfusion and use of new needle for ear/nose piercing were encouraging where 247 (71%), 221 (63.9%) and 246 (73.9%) respondents respectively said they always ask for new syringes, needles and screened blood if in need. However, when asked about their comfort in meeting with people having hepatitis only 83 (24%) participants said they would feel comfortable. Positive and statistically significant correlation was found between having been screened for hepatitis and better knowledge about safe practices such as safe blood transfusion and use of new blades/needles ( $\chi^2$  0.151,  $p=0.005$ ). Similarly, those who were vaccinated against hepatitis B were found more comfortable in meeting people with the infection ( $\chi^2$  0.136,  $p=0.012$ ) (see table 5, section v).

3.4.2. Practices towards HIV: In their response towards practices for HIV, only 31 (8.7%) indicated they were screened for the infection, 277 (77.8%) said they never underwent HIV screening while 48 (13.5%) were not aware of their status. Regarding use of sharps and blood screening 260 (74.7%), 242 (68.2%) and 254 (73%) respectively stated they always ask for new syringe, screening of blood and new needle for ear/nose piercing when required. However, as in hepatitis, when asked if they feel comfortable in meeting people living with HIV, majority that is 246 (70%) expressed their discomfort. On bivariate analysis, having been screened for HIV was found to be positively correlated with practices such as safe use of sharps, needles and screening of blood. Again those who were comfortable in meeting people with HIV also exhibited better practices towards cautious use of sharps and needles (see table 5, section vi).

Finally, in section eight of the questionnaire, one multiple choice question was asked to assess existing practices of the participants towards needle stick injury. Participants were instructed to choose one best out of the given five responses. The results revealed only 131 (37.8%) participants knew about correct action to be taken in case of a needle stick injury while remaining 62.2% were either unaware or confused about their response in case they encounter such a situation in the hospital (table 6).

Overall, as presented in table seven, females tend to have better knowledge and practices for both hepatitis and HIV compared to male participants with statistically significant results. Similarly, messengers and supervisors were found more knowledgeable in addition to exhibiting safe practices compared to their fellow workers (table 8). Nationality, level of education or previous work experience did not appear to have any positive or negative correlation with knowledge or practices towards hepatitis and/or HIV.

**Table 1: Socio-demographic details of the study participants (N= 371)**

Variable	Number	%age
<b>Age</b> Mean 31 years Range 18-55 years		
<20	8	2.2
20-25	89	24
26-30	112	30.2
31-35	72	19.4
36-40	48	12.9
41-45	28	7.5
>45	10	2.7
<b>Gender</b>		
Male	161	43.6
Female	208	56.4
<b>Nationality</b>		
Bangladesh	213	57.4
India	93	25.1
Indonesia	19	5.1
Pakistan	14	3.8
Ethiopia	12	3.2
Saudi	12	3.2
Philippines	6	1.6
Srilanka	2	0.5
<b>First Language</b>		
Bangla	287	77.8
Indonesian (Bahasa)•	15	4.1
Arabic	12	3.3
Amharic*	12	3.3
Hindi*	12	3.3
Urdu	10	2.7
Pashto*	5	1.4
*Amharic language speakers were fluent in Arabic while Hindi and Pashto speakers were fluent in Urdu thus their interviews were conducted in the respective languages. Similarly, Bahasa speakers had good command on English, therefore their interviews were conducted in English.		
<b>Yrs. in School</b>		



Variable	Number	%age
0	123	33.2
1-5	59	15.9
6-10	159	42.9
>10	29	7.8
<b>Type of work in Al-Noor Hospital</b>		
Cleaners	255	68.7
Messengers	45	12.1
Laundry staff	29	7.8
Infectious waste disposal staff	25	6.7
Supervisors	17	4.6
<b>Work duration in Al-Noor Hospital</b>		
<1 yr.	209	56.8
1-5 yrs.	60	16.3
6-10 yrs.	51	13.9
>10 yrs.	48	13
<b>Job location before joining Al-Noor Hospital</b>		
Inside Saudi Arabia	94	26.4
Outside Saudi Arabia	11	3.1
No past work experience	251	70.5
<b>Source of information (Hepatitis)</b>		
Electronic Media	188	54.8
Health education in hospital	64	18.7
Friends/relatives	63	18.4
Print media	21	6.1
Others (including religious leaders)	7	2
<b>Source of information (HIV)</b>		
Electronic Media	192	56.6
Health education in hospital	64	18.9
Friends/relatives	62	18.3
Print media	16	4.7
Others (including religious leaders)	5	1.5

**Table 2: Knowledge about Hepatitis (B, C) and HIV**

<b>Section i) Knowledge about Hepatitis (B,C)</b>		
	<b>Number</b>	<b>%age correct response</b>
<b>Symptoms (Correct response “Yes”)</b>		
Can a person gets hepatitis at any age	236	67.6
Is jaundice a common symptom of hepatitis	185	53
Can a person with hepatitis remain symptomless	152	43.9
<b>Mode of transmission (Correct response “Yes”)</b>		
Can hepatitis be transmitted through syringes, needles and surgical instruments?	214	61.1
Can hepatitis be transmitted through needle stick injury?	213	61.6
Can hepatitis be transmitted through blood and body fluids?	201	57.8
Can hepatitis be transmitted through transfusion of blood?	187	54
Can hepatitis be transmitted through blades of barber?	165	49.3
Can hepatitis be transmitted through ear and nose piercing instruments?	168	49.3
Can hepatitis be transmitted by unsafe sex (e.g. not using condoms)?	191	55.7
Can hepatitis be transmitted from infected mother to new-born?	229	66.2
<b>How Hepatitis is not transmitted (Correct response “No”)</b>		
Can hepatitis be transmitted through contaminated water?	85	24.5
Can hepatitis be transmitted by shaking hand	139	39.8
Can hepatitis be transmitted by eating and drinking in the same plate/ glass of a hepatitis-positive person	88	25.1
Can hepatitis be transmitted through mosquito/insect bite	67	19
Can hepatitis be transmitted by sharing same toilet with an infected person?	110	31.4
<b>Treatment and vaccination</b>		
Is there treatment available for Hepatitis? (Correct response “Yes”)	241	69.7
Is there a vaccine available for Hepatitis B? (Correct response “Yes”)	172	49.1
Is there a vaccine available for Hepatitis C? (Correct response “No”)	67	19.4
<b>Section ii) Knowledge about HIV</b>		
	<b>Number</b>	<b>%age correct response</b>
<b>Symptoms (correct response “Yes”)</b>		
Can a person gets HIV/AIDS at any age	253	70.5
Can a person with HIV/AIDS remain symptomless	132	36.7
<b>Mode of transmission (correct response “ Yes”)</b>		

<b>Section ii) Knowledge about HIV</b>		
Can HIV/AIDS be transmitted through syringes, needles and surgical instruments?	289	79.8
Can HIV/AIDS be transmitted through needle stick injury?	263	72.3
Can HIV/AIDS be transmitted through blood and body fluids?	258	71.1
Can HIV/AIDS be transmitted through transfusion of blood?	272	75.6
Can HIV/AIDS be transmitted through blades of barber?	187	54.8
Can HIV/AIDS be transmitted through ear and nose piercing instruments?	177	49.4
Can HIV/AIDS be transmitted by unsafe sex (e.g. not using condoms)?	298	82.1
Can HIV/AIDS be transmitted from infected mother to new-born?	231	64.2
<b>How HIV/AIDS is not transmitted (correct response "No")</b>		
Can HIV/AIDS be transmitted through contaminated water?	109	30.4
Can HIV/AIDS be transmitted by shaking hand	165	45.6
Can HIV/AIDS be transmitted by eating and drinking in the same plate/ glass of a hepatitis-positive person	116	32.2
Can HIV/AIDS be transmitted through mosquito/insect bite	64	17.8
Can HIV/AIDS be transmitted by sharing same toilet with an infected person?	117	32.6
<b>Treatment and vaccination</b>		
Is there treatment available for HIV/AIDS?	216	60.2
Is there a vaccine available for HIV/AIDS?	87	24.1

**Table 3: Positive attitude towards Hepatitis (B, C) and HIV**

Hepatitis (B,C)	Positive Attitude			
	Hepatitis (B,C)		HIV	
	Number	%	Number	%
Do you think you can you get hepatitis (B,C)/HIV*	269	76.6	265	73.6
What will be your reaction if you find you have hepatitis (B,C)/HIV**	178	51.1	200	56.5
Would you talk to someone about your infection***	299	85.2	300	83.8
If yes, with whom you talk first****	163	47.6	167	46.9
What worries you most if you are diagnosed with hepatitis (B, C)/HIV*****	316	93.5	322	91.5

\*Yes is considered positive attitude.

\*\*Fear is taken as positive attitude while shame, surprise and sadness as negative attitudes.

\*\*\*Yes is considered positive attitude.

\*\*\*\*Talking to physician (doctor/nurse) and/or supervisor is taken as positive attitude.

\*\*\*\*\*Fear of death, disease spread and losing job and worry regarding cost of treatment are taken as positive attitudes.



**Table 4: Safe practices towards Hepatitis (B, C) and HIV<sup>#</sup>**

	Safe practices			
	Hepatitis (B,C)		HIV	
	Number	%	Number	%
Have you ever been screened for Hepatitis/HIV	62	17.7	31	8.7
Are you vaccinated for Hep B	84	24.1	NA	
Do you ask for new syringe, when in need	247	71	260	74.7
Do you ask for blood screening, when in need	221	63.9	242	68.2
Do you ask for new blade, when required	208	63.4	213	62.6
Do you ask for new needle for ear/nose piercing	246	73.9	254	73
In case you are positive will you go for treatment	271	79.2	271	77.7
Do you feel comfortable in meeting Hep/HIV positive people	83	24.3	105	29.9

# A "Yes" response is considered as safe practices for all the given questions.

**Table 5: Positive correlation on bivariate analysis**

		Correlation	Pearson Correlation 'r'	p value
section i	Knowledge (Hepatitis B,C)	Knowledge about the terms Hepatitis B,C and modes of disease transmission	0.164	0.002
		Knowledge about modes of transmission of hepatitis and awareness about treatment availability for hepatitis	0.147	0.006
section ii	Knowledge (HIV/AIDS)	Knowledge that a person with HIV can remain symptomless and modes of HIV transmission	0.177	0.001
		Knowledge that a person with HIV can remain symptomless and treatment availability for HIV	0.159	0.003
section iii	Attitude (Hepatitis B,C)	Showing positive attitude if got the infection and willingness to share the information with doctor/nurse	0.132	0.013
section iv	Attitude (HIV)	Showing positive attitude if got the infection and better knowledge about modes of HIV transmission	0.160	0.003
section v	Practices (Hepatitis B,C)	Having been screened for hepatitis and exhibiting safe practices	0.151	0.005
		Vaccinated against hepatitis B and feeling comfortable in meeting people with the infection	0.136	0.012
section vi	Practices (HIV)	Having been screened for hepatitis and exhibiting safe practices	0.128	0.017
		Feeling comfortable in meeting people living with and exhibiting safe practices	0.146	0.007

**Table 6: Response to Needle sticks injury**

Response	Num	%age
Do nothing	47	13.5
Immediately wash and inform supervisor to seek medical care*	131	37.8
Inform supervisor before washing the site of injury	44	12.7
Squeeze blood from the site of injury and before informing supervisor	99	28.5
Wash or squeeze blood and then bandage the wound without informing anyone	26	7.5

\*correct response.

**Table 7: Comparison: Gender vs. knowledge adequacy and safe practices**

Dis category	Variable	Gender		(x <sup>2</sup> )	P-value	95% Confidence Interval
		Male N (%) 161(43.6)	Female N (%) 208 (56.4)			
Hepatitis (B,C)	Adequate Knowledge	69 (42.8%)	111 (53.3%)	5.34	0.021	(1.078 - 2.516)
	Safe Practices	70 (43%)	124 (59.6%)	11.88	0.001	(1.378 - 3.249)
HIV	Adequate Knowledge	87 (54%)	134 (64%)	4.51	0.034	(1.035 - 2.424)
	Safe Practices	90 (55.9%)	149 (71.6%)	11.72	0.001	(1.389 - 3.406)

**Table 8: Comparison: Type of work vs. knowledge adequacy and safe practices**

Dis category	Variable	Type of Work					(x <sup>2</sup> )	P-value	95% Confidence Interval
		Cleaner N = 255	Inf.wast.disp. staff N = 25	Laundry staff N = 29	Messengers N = 45	Supervisors N = 17			
Hepatitis (B,C)	Adequate Knowledge	120 (47.1%)	9 (37.5%)	9 (31%)	29 (64.4%)	13 (82.4%)	14.1	0.007	(0.004 – 0.007)
	Safe Practices	127 (56.4%)	12 (50%)	13 (44.8%)	30 (66.7%)	12 (70.6%)	5.8	0.2	(0.201 – 0.222)
HIV	Adequate Knowledge	142 (55.7%)	19 (76%)	10 (34.5%)	37 (82.2%)	14 (82.4%)	25.3	0.000	(0.000 – 0.000)
	Safe Practices	164 (64.3%)	16 (64%)	13 (44.8%)	34 (79.6%)	12 (70.6%)	9.3	0.05	(0.05 - ).06)

#### 4. DISCUSSION

This study is an effort to assess the knowledge, attitude and practices of sanitary staff that by virtue of nature of their work in hospital are at a constant risk of acquiring blood-borne infections such as hepatitis and HIV. The study results revealed only about half of the participants had adequate knowledge for both Hepatitis (B, C) and HIV. Cleaning of blood and body fluids in hospital is one of the main responsibilities of the sanitary staff, however, only a little more than half had clear idea about blood and body fluids as possible modes of transmission for hepatitis (B,C). In contrast to hepatitis, participants'

knowledge about blood and body fluids as potential sources of HIV transmission was found somewhat better. Another study by Rajderkar and colleagues on knowledge of hospital support staff about modes of HIV transmission revealed similar results.<sup>[8]</sup> This difference may be attributed to prominent media coverage of HIV in the last couple of decades.<sup>[9]</sup> Nevertheless, when asked about questions that required slightly in-depth knowledge such as “can a person with hepatitis or HIV remain symptomless”, a considerable majority could not answer it correctly. Similarly, 47% did not know about jaundice as a common symptom of hepatitis confirming

gaps in existing knowledge of the participants about these infections.

The study findings further highlighted number of myths and misconceptions among the participants such as 54% believed shaking hand with an HIV positive person can expose them to the risk of acquiring HIV while 68% were of the opinion that by sharing toilets they can get hepatitis (B,C). Likewise, a high proportion of participants believed contaminated water and mosquito bite as possible sources of hepatitis and HIV transmission. Other studies with similar populations also found participants' believing in causal contacts as possible source of blood-borne infections.<sup>[9,10]</sup> Persistence of these misconceptions can seriously influence behaviour of sanitary workers towards patients that can ultimately affect the quality of healthcare provision in the hospital. It is further evident from the finding that more than 70% of the participants showed their reluctance in meeting people with either hepatitis or HIV. Similarly, although working in a high risk environment only half of the respondents had knowledge about availability of hepatitis B vaccine while 76% wrongly believed there exist a vaccine for HIV. In addition to deficiencies in the existing training methodology another possible explanation to these suboptimal results is language barrier being faced by the sanitary worker while working in a dominantly Arabic speaking country. As mentioned earlier, majority participants were non-Arabic speakers who at the same time were not familiar with English language; thereby making it difficult for the trainers (mostly Arabic speakers) to communicate effectively and impart correct information.

Regarding attitudes, a high proportion of the respondents had an idea that they can get hepatitis or HIV at any stage of their life and were also comfortable in sharing the information in case they acquire these infections. This finding that majority participants were willing to talk about these diseases is encouraging especially in the context of HIV where due to stigma people, in general, prefer to hide their disease status.<sup>[11]</sup> However, interestingly, when asked about their reaction if they actually got the disease nearly half of them exhibited negative attitudes such as shame, surprise and sadness. Studies by Noman and Lynne also highlighted "shame" as one of the significant responses of participants when diagnosed with hepatitis or HIV.<sup>[7,12]</sup> In another question where we asked our study respondents about their main worry if diagnosed with one of these infectious diseases majority were concerned about cost of treatment, disease spread in their families and fear of death. This response can be explained in the context that most people coming to Saudi Arabia from developing countries are main bread-earners for their families and such a diagnosis can lead to economic constraints both in terms of cost of treatment and possible death. Accurate knowledge about infection prevention, available treatment options and vaccination (for hepatitis B) in addition to information

about their healthcare rights as employee can alleviate some of the anxieties and improve attitude of the participants towards these infections.

In Al-Noor hospital one of the key policy instructions for the employees is to inform their supervisor or staff physician in case of acquisition or exposure to an infectious disease so that immediate treatment and care can be provided. However, when asked with whom they would like to talk to first if acquire the disease nearly 40% of the study participants preferred someone else other than their supervisor or staff physician. A possible explanation to this negative attitude might be fear of expulsion from job if found positive; which ultimately leads to delay in seeking timely and appropriate healthcare. Based on the results, we emphasise on improved infection prevention and control training program so that employees should not acquire these infections at first place. At the same time, as mentioned before, appropriate awareness regarding employee's healthcare rights and benefits needs to be clearly communicated to reduce these delays in seeking healthcare.

Participants' responses towards practices again revealed some astonishing results. Baseline tests for hepatitis (B,C), HIV and certain other diseases are mandatory to get employment in Gulf Cooperation Council (GCC) member states that include Saudi Arabia. However, in their response to question on screening for hepatitis and HIV, 82% and 91% participants respectively stated either not being screened or did not know at all if they were screened for these diseases. Keeping in view these tests are essential to get work visa for Saudi Arabia, it is speculated that the potential employees are tested in their home countries but no detailed information regarding the nature of tests done is provided to them. As regard vaccination for hepatitis B, it is strongly recommended in Saudi Arabia for healthcare workers.<sup>[13]</sup> However, in their response to hepatitis B vaccination 75.9% respondents were either not vaccinated or not sure whether they were vaccinated. This result is in line with other studies where low vaccination rates were noticed among sanitary/ housekeeping staff compared to other hospitals employees such as nurses and doctors.<sup>[14,15]</sup> Low vaccination rate coupled with inadequate knowledge of our participants on how to deal with needle stick injury are two significant findings warranting immediate action by the concerned stakeholders including ministry of health, parent agencies hiring these sanitary workers and the hospital management.

## 5. CONCLUSION/ RECOMMENDATIONS

Our study brings into light serious gaps in knowledge, attitude and practices of sanitary staff in Al-Noor hospital towards two most common infectious diseases, namely, hepatitis (B,C) and HIV. These results combined with exposure of sanitary workers to potentially hazardous physical and biological substances on daily basis and their low vaccine coverage make them

especially vulnerable to acquiring an infection in the hospital. The findings indicate the existing training program is not effective enough to improve knowledge towards infectious diseases which in fact is the first step towards adaptation of appropriate behaviours and safe healthcare practices. Studies have shown that inadequate knowledge in itself is a barrier to bringing a positive change in attitudes and practices.<sup>[16]</sup> In fact, an ignorant or unconvinced mind can become a strong obstacle to adapting a positive behaviour or dropping an incorrect belief.<sup>[17,18]</sup> As evident from the findings of this study there is a strong need to revise the existing training methodology for sanitary workers in Al-Noor hospital. Keeping in view the language barriers we suggest training material should be made more pictorial with addition of educational videos in native languages of the participants. These strategies will allow the sanitary workers to understand the subject with clarity and better prepare them to adapt positive attitudes and safer practices. At the same time we suggest two or three sanitary workers from each country group should be identified and trained as master trainers for further trainings of their country fellows. This approach will not only be useful for overcoming the language barrier but also reduce the work load for regular trainers. In addition, we propose review of the existing hiring policy by the relevant authorities so that the potential employees, while still in their home countries, should be informed in detail about the benefits of pre-employment investigations and the occasion should also be used as an opportunity to provide basic health education including awareness about infectious diseases.

### 6. Study implications

To the best of our knowledge no study on KAP towards infectious diseases among sanitary workers has been conducted before in Saudi Arabia. Therefore, the current study project will be a valuable contribution to the existing scientific research in the country. The recruitment procedure (including countries from where the sanitary staff is hired) is same for all government hospitals in Saudi Arabia; thus we expect similar demographics as well as baselines knowledge, attitude and practices of sanitary staff in other hospitals as in Al-Noor. The findings of this study can, therefore, be applied to other hospitals in Saudi Arabia and can be used to revise/ improve the training programs for sanitary staff in all public hospitals in Saudi Arabia.

### 7. ACKNOWLEDGMENTS

The authors thank Ms Farida Begum, senior nurse, General Medicine Department, Alnoor Hospital for supervising Bangla translation of the survey questionnaire, as well as, Mr. Sharif Habib-ur-Rehman, Messenger Infection Control Department, Alnoor Hospital for revision and refinement of the Bangla version of the questionnaire. Both the colleagues are native Bangla speakers. In addition, the authors expressed their highest gratitude to all the participants for taking their time off and participating in this study.

### 8. Author Contributions

MG provided the basic concept and supervised the whole project. SA designed the questionnaire and along with DA trained team of interviewers as well as conducted interviews and drafted the initial manuscript. HA carried out critical review of the manuscript and supervised statistical analysis conducted by HK. Final manuscript was reviewed and approved by all authors.

### 9. Conflicts of Interests

The authors declared no competing interests.

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