Awareness of Medical Professionals about Common Disinfectants in a Tertiary Care Hospital Against Corona Virus

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ABSTRACT

Objective: To assess the working knowledge of health care workers (HCW) regarding the appropriate use of disinfectants against Coronavirus in hospital care settings using a questionnaire.

Study Design: Cross-sectional study.

Place and Duration of Study: Combined Military Hospital Lahore, Pakistan, from Apr 2020.

Methodology: Two hundred health care workers were consecutively selected and divided into two groups, irrespective of gender. Each participant had to fill a structured proforma containing twenty-five close-ended questions.

Result: Group-1 participants were 126 (63%) and group 2 participants were 74 (37%). 117 (92.8%) group-1 participants were 20–30 years of age and degree holders while 40 (54%) group-2 participants were 31-40 years old and diploma holders. Significant awareness (p<0.001) regarding disinfectants was observed in group-1 (102 81%); all the degree holders were well aware of disinfectants and required less training. In contrast, in group-2, 44 (59%) were fully aware of disinfectants; the rest did not qualify and needed proper training. Participants with a good educational status and work experience of >10 years were the high achievers in both groups.

Conclusion: This study revealed that majority of the participants knew about the correct usage of disinfectants and they were fully prepared to handle the ongoing pandemic. Another finding was that awareness was directly related to relevant education, prolonged work experience and age.

Keywords: Awareness, Disinfectants, Health care professionals.

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INTRODUCTION

World Health Organisation (WHO) has been instrumental in providing timely advice to the front line fighters regarding preventive measures and techniques and knowledge about appropriate disinfectants to limit the spread of COVID 19 outbreak.[1,2,3] Health care workers (HCWs) are at a greater risk of acquiring such deadly pathogens. Long working shifts, physical and psychological stresses, fatigue, and fear predispose them to infection.[4,5]

Appropriate choices regarding which disinfectants to be used to kill the pathogen keeping the enveloped nature of the virus in view is need of the hour,[6,7] in an era where markets are flooded with a variety of disinfectants. There are enormous claims by vendors about the virucidal activity of their products; making the right choice is a safe requisite.[8,9]

This study had been planned to assess the baseline knowledge of HCWs regarding the appropriate use of disinfectants against Corona virus in hospital care settings during an ongoing pandemic using a questionnaire.

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METHODOLOGY

A cross-sectional study was conducted at CMH Lahore from April to April 2020 after appro-val from the Institutional Ethical Committee (ERC no 174/2020). The sample size was calculated using the WHO calculator with a population proportion of 0.847%, absolute precision of 0.05% and 95% confidence interval (CI after taking a design effect of 2 and 5% non-response rate).[10]

Inclusion Criteria: All the health care workers, mainly doctors, nurses, paramedics and ancillary of the Combined Military hospital (CMH) Lahore, were included in the study.

Exclusion Criteria: Individuals who were on leave of any type during data collection and non-consenting health care workers were excluded.

A structured proforma was distributed to HCWs as a pilot project. The pilot study was conducted on,[11] (5.5%) participants to assess the understanding of the contents of proforma regarding awareness, and necessary modifications were made before starting the

study. After the pilot study, two hundred (200) health care workers, were consecutively selected in the study. The proforma had been designed containing 25 close-ended questions. Members of the Infection Control Committee were responsible for the distribution, collection and examination of data daily.

Each correct answer was allocated as 1 mark and wrong answer as 0 mark. Results of the questionnaire were compared with a list compiled by the hospital infection control committee (ICC) about disinfectants suitable for surfaces, hand sanitisation and hospital equipment. Achiever of the mean of the total score was labelled as aware.

A score of 20-25 meant aware, 15-20 was taken as aware and less than ten interpreted as HCWs needing improvement and further training about disinfectants.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. The chi-square test was used to comparethe two sets of HCWs (doctors and paramedics). The dependent and inde-pendent variables were evaluated using bivariate regression analysis. Model fitness (p=0.25) and R squa-red of Cox, Snell, and Nagekerke (0.85) were applied. Variables with the p-value ≤0.05 were considered statistically significant.

RESULTS

A total of 200 participants were consecutively selected (medical and paramedical staff). They were divided into two groups based on qualifications. Group-1 consisted of doctors and nurses, while group 2 consisted of operation theatre assistants (OTAs), laboratory technicians (lab techs), dispensers, pharmacists, computer operators, ayas and sanitary workers.

Two hundred ten questionnaires were distributed, and the response was received from 200 parti-

Table-I: Socio-demographic characteristics of hospital health care workers.

Socio-Demographic Characteristics		Frequency	Percentage%
Age	21-30	141	70.5%
	31-40	47	23.5%
	41-50	11	5.5%
	51-above	01	0.5%
Gender	Male	109	54.5%
	Female	91	45.5%
Martial Status	Married	76	44.5%
	Unmarried	124	55.5%
Education	MBBS Degree	111	55.5%
	FCPS Degree	06	03%
	Diploma	0	0%
	Dip OT	42	21%
	Dip Lab	12	06%
	Dip Nursing	0	4.5%
	Dip Pharmacy	15	7.5%
	M.Phil	01	0.5%
	FA	02	01%
	Others	02	01%
Service Experice	< 5 yrs	129	64.5%
	5-10 yrs	13	6.5%
	11-20 yrs	46	23%
	>20 yrs	12	6%
Profession	Consultants	06	03%
	Doctors	111	55.5%
	Nurses	09	4.5%
	Operation Theatre Assistant	42	21%
	Laboratory Technicians	13	6.5%
	Pharmacists	01	0.5%
	Dispenser	14	7%
	Computer Operator	01	0.5%
	Others	03	1.5%

Others; Sweepers, Computer Operator, Dip OT, Dip lab, Dip nursing, Dip pharmacy; diploma in operation theatre technology, laboratory, nursing and pharmacy

cipants constituting a response rate of 95.2%. The mean age of the participants was 28.1 ± 6.74 years. The majority of health care workers (141, 70.5%), belonged to younger age group, i.e. 21-30 years of age.

Major respondents in group-1 were (MBBS, FCPS and M.Phil) degree holders 118(59%), while in group-2 major respondents 79 (39.5%) were diploma holders (Table-I).

The total score of the questionnaire was 25. Only 146 participants were found knowledgeable regarding disinfectants against various surfaces, amongst whom 86 (43%) were fully aware, 60 (30%) were aware, and 54 (27%) required teaching and training. Most participants did not know how to disinfect gowns (89, 44.5%) and mattresses (70,35%). 99.9% correct response was received in cases of PPEs and floors (Table-II).

Table-II: Level of awareness about disinfectants against corona virus in both the groups.

Parameters	Group-1 (n=126) Yes	Group-2, (n=74) Yes	*p*-value
Surfaces			
Floor	124 (98.4)	74 (100)	0.744
Bed Pan	111 (88)	44 (59.4)	*0.0001
Bed Frame	119 (94.4)	45 (61)	*0.0001
Mattress	85 (67.4)	44 (59.4)	0.802
Sink	118 (93.6)	73 (98.6)	0.994
Mirrors	120 (95.2)	71(95.9)	*0.049
Walls	96(76.19)	57(77.0)	*0.03
Commode	114 (90.47)	74(100)	0.938
Electro Medical Equipments			
ECG Machine	100 (79.3)	45 (35.7)	*0.004
Monitor	109 (86.5)	72 (57.1)	*0.001
Sucker Machine	116 (92.0)	44 (59.4)	*0.002
Intra Venous Stand	116 (92.0)	45 (60.8)	*0.0001
Stethoscope	116 (92.0)	45 (60.8)	*0.001
Thermometer	112(88.8)	45(60.8)	*0.001
Blood Pressure Apparatus	105(83.3)	45(60.8)	*0.015

**Group I&II; Indicates number of participants who answered correctly or written the name of correct disinfectant*

25/25 was achieved by learned members of groups-1 and 2 only. Operation theatre assistants (OTA) were the highest scorers amongst group-2 members, while MBBS FCPS degree holders were the highest scorer in group-1 (Figure).

Work experience was the key factor towards better awareness of disinfectants against various surfaces. 100% of score achievers had more than ten years of experience in the health care system (OTAs and degree holders).

Age was another strong predictor of better awareness amongst both the groups as most of the high achievers in both the groups were between 35-50 years of age. In bivariate analysis, variables that significantly affected the individuals' awareness were educational status and age (p<0.05).

Multiple regression was run to predict awareness from age and education. These variables significantly predicted awareness [F (2,197)=2145.088; p<0.001, R2= 0.956]. Greater the education and age, greater was the awareness level of an individual regarding disinfectants.

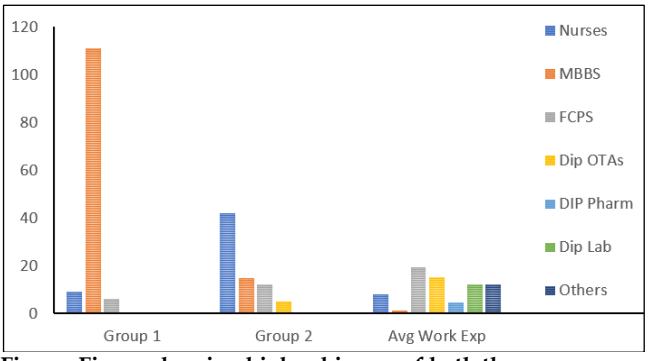

Figure: Figure showing high achievers of both the groups.

DISCUSSION

This study was designed to find out the awareness level of health care workers, involved in infection prevention and control. Knowledge of disinfectants is required in the COVID-19 pandemic as the disease itself is novel, and nothing can be predicted at this point and maybe after the treatment. The only way out of

Table-III: Linear regression table to predict statistical significance with awareness.

Model	Unstandardised coefficients		Standardised Coefficients			95%CI for B	
	B	Std Error	Beta	t-value	*p*-value	Lower Border	Upper Border
Education	-		0.473	-	0.001	-	-
Constant	23.663	-	-	50.011		24.596	22.730
Education	0.338	0.063	0.089	5.347	0.001	0.214	0.463
Age	1.026	0.018	0.936	56.342	0.001	0.990	1.062

Members of the group-1 proved to be more knowledgeable about disinfectants. 102 participants got an excellent score, compared to group-2, where only 44 participants got the total score. The short score of

this pandemic is a better-sanitized environment for which a proper disinfectant is required.[11,12]

Combined Military Hospitals (CMH) of Pakistan Army in provincial capitals serve as tertiary care hospitals. These CMHs usually have consultants/doctors having high professional competence, experience and training. They learn relatively quickly, but precisely through the experience, they are already well versed with appropriate disinfectants for hospital instruments, surfaces and materials.[12,13] This observation was reflected in our collected data. Most degree holders in group-1 (21%) and diploma holders in group-2 (21%) were amongst the high achievers, a finding well correlated with the findings of Melaku Desta *et al*.[14] The significant outcome of the study was that educational status and awareness go hand in hand in achieving an understanding of an individual.

Another significant finding in our study was that most of the health care workers with work experience > 11-20 years were well versed with the disinfectants and required fewer teaching and training sessions, as evident from the data that 33/44 participants of both the groups were almost trained to handle the pandemic, they not only had the education but the work experience that was needed in such situations. Similarly, two participants from group-2 had the highest score, although illiterate yet had a work experience of >10 years, showing that work experience had its standing in awareness of an HCW and they could acquire awareness/knowledge while working with learned members society.[15,16]

The rest of the group-2 members did not qualify as knowledgeable/aware. It required training because both the factors less education and less work experience compounded, resulting in poor awareness level; vari-ous studies about assessment of knowledge/ awareness had similar findings.[17,18] HCWs aged beyond 50 years, despite meagre knowledge, perfor-med well and had quite a significant score. This find-ing suggested that an HCW with increasing age would have twice the experience of participating in infection control activities and be well-versed with appropriate disinfectants for surfaces, equipment and items.[16,19]

Results of our study showed that individuals' awareness were directly related to an appropriate education. Studies by Jawad Ahmad *et al*,and Naseer Ahmad*et al*,also emphasized continuous training of HCWs through workshops, webinars, seminars and courses on disinfectants.[20,21]

As our worthy front liners are at continuous risk of acquiring Corona infection best possible solution is to keep them updated regarding new guidelines about infection prevention, control and how possible chain of transmission could be breached through better practices and disinfectants.[21] Their gaps in knowledge, if addressed through appropriatetraining will result in early control or containment of the COVID 19 pandemic in communities.[22]

A multifaceted approach has been emphasized by Qasim *et al*, which should include a complete cultural change in which every person is responsible for his or her cleanliness and sharing the responsibility of keeping the surroundings clean. This requires the remodelling of professional society through open communication in open forums and work talks.[23]

This study conclusively helped hospital administration assess how many HCWs knew about the correct usage of disinfectants in health care settings against the current pandemic of Coronavirus, and collected data also helped in better preparedness of HCWs against such pathogens and to handle these pandemics in future better. Additional factors that directly or indirectly affected the knowledge/awareness were also explored in HCWs.

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STUDY LIMITATIONS

The main limitation in this study was that it was solely done in a tertiary care setting, and doctors and paramedics from small Army setups were omitted had that been done a sole comparison of awareness about disinfectants between HCWs of tertiary care settings and minor fields and district hospitals would have been achieved.

RECOMMENDATIONS

1. All hospital staff, including (ayas, helpers, couriers and sanitary workers) should be given training regarding appropriate disinfectants.
2. Adherence to appropriate disinfectants should be monitored regularly by the doctor in charge as it is the only means through which the Coronavirus can be combated.
3. From time to time, such qualitative assessments of HCWs should be undertaken to improve training quality in all Army hospitals.

Conflict of Interest: None.

Authors' Contribution

QF:, KHSB: Main contribution to concept, design and work, ALK: Data collection and entry, NU: Data analysis and inter-

pretation, NS: Data analysis, NJM: Final approval of manuscript.

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