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26 **Abstract**

27 **Background**

28 Novel Coronavirus infection disease 2019 (NCOVID-19), caused by the corona virus, was first
29 spotted in Wuhan, city of China, December 2019. The NCOVID-19 virus is spread among
30 individuals through close communication in the form of droplets, not via airborne. Those
31 individuals are at risk of infection who are in close contact with a NCOVID-19 patient or who
32 take care of NCOVID-19 patients. Infection prevention and control measures are critical to
33 prevent the possible spread of any infection in healthcare facilities. Therefore, healthcare
34 workers should be aware of basic knowledge and all procedures concerning prevention and
35 protection from NCOVID-19.

36 **Objective**

37 The objective of this study was to evaluate the awareness level of healthcare workers toward
38 NCOVID-2019 in Pakistan.

39 **Material and Methods**

40 A questionnaire was generated according to WHO information that was circulated among the
41 healthcare workers of different hospitals and medical institutes of Pakistan. Calculated sample
42 size was 650.

43 **Conclusion**

44 Healthcare workers have insufficient knowledge of preventive measures and infection control.
45 The authorities must take initiatives on urgent basis to increase the awareness among the
46 healthcare workers and general public also so that the drastic circumstances can be avoided in
47 the developing country like Pakistan.

48 **Introduction**

49 The recognition of Human coronaviruses (HCoV) firstly came during the 1960s in the noses of
50 patients with the nasopharyngitis. There are some known species of coronavirus 229E, NL63,
51 OC43, and HKU1 in which two species of coronaviruses, OC43 and 229E are responsible to
52 affect a huge percentage of common colds.(1) In Latin "Corona" means" crown. The name of
53 Coronaviruses was given due to the crown-like projections on their surfaces. Infections are
54 frequently occurring during winter season moreover in early spring because the temperature is
55 favorable for viruses. Therefore, this is very common an individual easily get infected with
56 coronavirus. An antibody of coronavirus does not last for a long time. Additionally, one strain of
57 the antibodies of coronavirus may be useless against other strains.(2)

58 Novel corona viruses are those viruses that usually cause pathogenesis in mammals along with
59 human beings by affecting their respiratory tract. These viruses are linked with the conditions

60 like Severe acute respiratory syndrome (SARS), common cold and pneumonia. Additionally,
61 they are also capable of affecting the gut. In 1937 coronavirus was first isolated from an
62 infectious bronchitis virus in birds that could significantly ravage poultry stocks. Almost 15 and
63 30 percent of common cold are caused by these viruses. During the last 70 years, scientists
64 revealed that coronaviruses are able to contaminate mice, rats, horses, pigs, and cattle, dogs, cats,
65 turkeys.(3)

66 Different species of human coronaviruses includes 229E, NL63, OC43, and HKU1, typically
67 source of mild to moderate upper-RTI, like the common cold. It is high in chance that people can
68 get affected or fell ill by these viruses at some point in their life. These infections mainly last
69 only for a specific period. Runny nose, headache, cough, sore throat, fever are included in
70 coronaviruses symptoms. Human coronaviruses can at times cause lower-respiratory tract
71 sicknesses, like pneumonia or bronchitis. People with cardiopulmonary disease, Compromised
72 immunity, children and older adults are at more risk.(4, 5) Different studies have been reported
73 two more types of human coronaviruses, MERS- CoV and SARS-CoV are responsible to cause
74 severe respiratory symptoms. MERS have symptoms like cough, fever and shortness of breath
75 which often lead to pneumonia. The reported patients with MERS are around 3/10 and they have
76 died.(3, 6, 7) SARS symptoms comprised of having fever, chills, and body aches which usually
77 progressed to pneumonia. Since 2004 there is no human case reported in the world with
78 SARS.(8) This study was contained the questioner-based knowledge of healthcare workers
79 regarding the current pandemic outbreak of novel corona virus-19.

80 Novel Coronavirus disease 2019 (NCOVID-19), caused by the corona virus, was first spotted in
81 Wuhan, city of China, in the month of December 2019. (9) The Director-General of WHO has
82 stated on 30 January 2020, that the current outbreak commenced a health emergency of

83 worldwide concern. On account of available evidence, the NCOVID-19 virus is spread among
84 individuals through close communication in the form of droplets, not via airborne. Those
85 individuals are at risk of infection who are in close contact with a NCOVID-19 patient or who
86 take care of NCOVID-19 patients especially healthcare workers. This is very critical to prevent
87 the possible spread of any infection in healthcare facilities. Therefore, healthcare workers should
88 be aware of basic knowledge and all procedures concerning prevention of and protection from
89 NCOVID-19.(10)

90 **Route of Transmission**

91 Novel coronaviruses can spread through direct or indirect routes. Such as, one person infected
92 with virus infected other non-infected person via air by sneeze, cough and close personal
93 interaction(11), like shake-hands, touch an object or surfaces contaminated with coronavirus, and
94 touch other body part specifically mouth, nose or eyes.(12, 13) Infrequently, spread through fecal
95 route. Coronavirus survive in the fall and winter season therefore; breakout with common human
96 coronaviruses in this season is on large scale. Though, people become infected at any time of the
97 year. Recently it has been reported that in Germany one case of 2019-nCoV infection shows that
98 the virus may also spread by contact with patients without symptoms.(14)

99 **Prevention and Treatment**

100 Presently, there are no medications and vaccination are available to protect against novel
101 coronavirus infection. Coronavirus can live 12 hours on metal surfaces and 9 hours on fabric.
102 The only way to protect from this virus is to Wash hands with soap and water again and again.
103 Frequently use a hand sanitizer alcohol based and prevent touching the body parts like eyes,

104 nose, and mouth with unwashed and dirty hands. Face to face or close contact with others should
105 be avoided, Mouth and nose should be covered with a tissue when you sneeze or cough, used
106 tissue should be thrown in the dustbin and hands should be washed. Clean and disinfect objects
107 and surfaces.(9, 15)

108 **Materials and Methods**

109 **Study Population**

110 The study participants were recruited from the healthcare workers of basic health units and
111 primary, secondary and tertiary healthcare facilities across the major cities of Pakistan from the
112 province of Sindh, Punjab, Baluchistan and Gilgit Baltistan. The study also included the
113 undergraduate students who are actively involved in clinical rotation and are in direct contact
114 with patients. The questionnaire containing 16 questions was formulated based on the
115 information given by WHO for NCOVID-19.

116 The questionnaire was divided into three sections in which 19 multiple questions were asked to
117 assess the knowledge, source of infection, symptoms, protection, infection control, and treatment
118 a single-item scale was used to record the respondents' replies. Taking 1 million health workers in
119 Pakistan, with 97% confidence interval, the sample size calculated was 650 using OpenEpi. Ethical
120 approval from the institute could not be sought due to the prevailing emergency situation/ lockdown in
121 the country institutions; however, consent from each participant was sought by they filled the online
122 questionnaire. The results were analyzed on SPSS version 24.0. The duration of the study was 10
123 days.

124 **Inclusion Criteria**

125 Medical doctors, volunteers and paramedical staff working at different healthcare facilities along
126 with undergraduate medical and dental students who were in direct contact with the patients
127 during their clinical rotations were included in the study.

128 **Results**

129 This study was based on online questionnaire, which was divided into multiple sections to assess
130 knowledge, source of infection, symptoms, protection, infection control, and treatment. Total
131 653 participants were recruited in this study from different hospital and medical institutes across
132 Pakistan. The participants comprised 208 (31.85%) doctors, 347 (53.14%) paramedical staff and
133 98 (15.01%) undergraduate students who are voluntarily involved in clinical rotation in different
134 hospitals of Pakistan.

135 Out of total, 65.69% of participants opted the correct definition of NCOVID-19 and 28.60%
136 were unaware of the correct definition of NCOVID-19, while 5.72% of participants had no idea.
137 More than one- quarter (77.47%) of the total participants answered that NCOVID-19 is a
138 pandemic outbreak whereas, 10.53% replied that they did not know, 9.40% responded epidemic
139 and 2.59% endemic. Moreover, 57.97% of participants had attained their information about
140 NCOVID-19 from media, 20.32% from social community and 3.06% from college, whereas
141 0.65% of participants had no idea. Most of the participants 86.99% considered that NCOVID-19
142 is contagious while, 3.58% participants replied that NCOVID-19 is not contagious and 9.43%
143 has no idea. Almost all of the participants (97.09%) answered NCOVID-19 spreads from
144 infected person with close contact while 1.62% answered contact with infected animal, 0.81%
145 fast food, 0.48% had no idea. Additionally, 37.54% of respondents opted that NCOVID-19 is

146 same as SARS and MERS whereas, 30.15% replied “not same” and 32.31% answered no idea.
147 (Figure-1)

148 **Figure-1: This figure shows that 6 questions related to knowledge about NCOVID-19**
149 **where 64.76% participants chose correct option of QNO-1. While, 77.61% participants**
150 **selected correct option of QNO-2, 75.88% participants chosen correct option of QNO-3,**
151 **87.23% participants selected correct option of QNO-4, 96.94% participants selected**
152 **correct option of QNO-5 and 37.54% participants selected correct option of QNO-6**

153 Furthermore, 95.80% respondents knew related symptoms such as difficulty in breathing, fever
154 and cough whereas, 2.10% participants responded only difficulty in breathing, 0.81%
155 participants answered only fever, 0.65% participants replied only cough and 0.65% replied no
156 idea. Huge percentage (92.41%) of the participants were aware of the preventive measures for
157 NCOVID-19. More than half of the participants (69.53%) answered that the surgical mask can
158 protect from the disease. (Figure-2)

159 **Figure-2: This figure shows 4 questions related to symptoms and preventive measures of**
160 **NCOVID-19 where 95.72% of participants opted correctly for QNO-1. While, 92.66%**
161 **participants selected correct option of QNO-2, 69.79% participants selected correct option**
162 **of QNO-3 and 63.40% participants selected correct option of QNO-4.**

163 More than two third 83.84% of the respondents were well informed that the corona virus can live
164 on surfaces and 48.40% of participants knew the period of incubation for corona virus is few
165 hours up to several days. More than one-third of the participants stated that the rate of mortality
166 of NCOVID-19 is about 2% globally and 66.13% knew that there is no treatment available for
167 NCOVID-19. Additionally, 92.38% of the participants were aware that the effected patients

168 recoverable from the disease and 24.64% opted that the people recovered from the disease can
169 still transfer or spread it whereas, 46.19% answered “NO” and 29.17% replied No idea. Majority
170 of the participants 94.49% answered that the infected person should be isolated and 63.92% of
171 the participants chosen that the isolation ward is available in their setup while, 21.68% replied
172 “NO” and 14.40% had no idea. More than two third of the participants 80.45% answered that
173 elders > 60 years are at higher risk while, 9.53% of the participants replied adults, 6.14% of the
174 participants answered infants and 3.88% of the participants answered newborns. (Figure-3)

175 **Figure-3: The figure shows 9 questions related to infection control and treatment of**
176 **NCOVID-19 where 82.87% of participants selected correct option of QNO-1. While,**
177 **47.85% participants selected correct option of QNO-2, 63.19% participants chosen correct**
178 **option of QNO-3, 65.80% participants selected correct option of QNO-4, 92.48%**
179 **participants selected correct option of QNO-5, 46.93% participants selected correct option**
180 **of QNO-6, 54.69% participants chosen correct option of QNO-7, 93.56% participants**
181 **selected correct option of QNO-8, 80.43% participants selected correct option of QNO-9.**

182 **Figure-4: Summarized assessment of the study**

183 **Discussion**

184 Since December 2019, the recently discovered novel coronavirus (2019- nCov) has caused the
185 outbreak in Wuhan the city of China.(16) Now, it has converted into pandemic outbreak. The
186 rapidly increasing number of cases and evidence of human-to-human transmission suggested that
187 the virus was more contagious than SARS-CoV and MERS-CoV.(17-19) a large number of
188 infections of healthcare workers have been reported and the specific reasons for the failure of
189 protection need to be further investigated.(19). Reported in recent study that >3000 (including

190 clinical diagnosis) healthcare workers have been infected with NCOVID-19.(20) Therefore, it is
191 need of the hour that healthcare worker should have proper information about knowledge,
192 prevention, infection control measures and available treatment of options of current pandemic to
193 control its further spread because healthcare workers are the first line combaters of the outbreak
194 and the second line transmission of disease. According to WHO report-60 on 19th, March 2020
195 there are 302 persons infected in Pakistan with the Corona virus and on an average 61 new cases
196 are being reported every day. However, this is not confirmed up till now that how many
197 healthcare workers are confirmed or suspected with infection.

198 As this study was based on questionnaire, which was divided into three main sections including
199 knowledge, source of infection, symptoms, protection, infection control, and treatment, our study
200 indicated that the 33 % of participants had enough awareness about the definition and source of
201 infection of NCOVID-19. Moreover, 36% participants were aware about the symptoms and how
202 to take preventive measures for NCOVID-19 and 31% of participants had awareness of infection
203 control and treatment of NCOVID-19 (Figure-4). Our data showed that there is insufficient
204 awareness of healthcare workers about NCOVID-19 here in Pakistan.

205 Our data shows the requirement for further continuing awareness education among healthcare workers as
206 well as improving public awareness about infection control. The pandemic outbreak of NCOVID-
207 19 and the increasing number of affected people day by day, there is an immense need to acquire
208 the basics information of infection control which is the main principle for protection from
209 NCOVID-19.

210 **Conclusion**

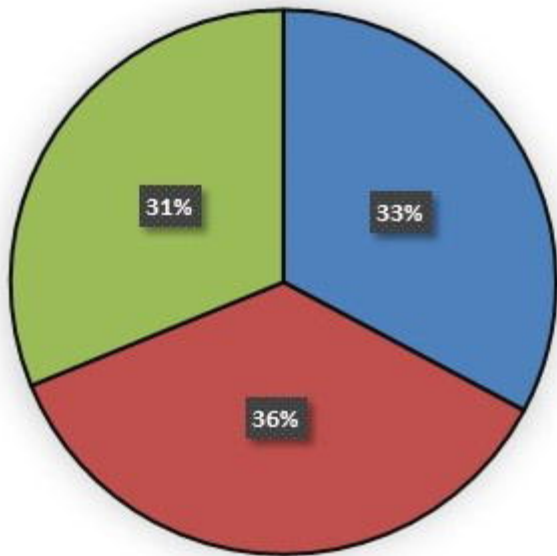
211 The important way to avoid the disease is to have proper knowledge and preventive measures.
212 Healthcare workers have insufficient knowledge of preventive measures and infection control.
213 The authorities must take initiatives on urgent basis to increase the awareness among the
214 healthcare workers and general public also so that the drastic circumstances can be avoided in
215 the developing country like Pakistan. This data has given us a clue about how serious our
216 healthcare workers are in dealing with this pandemic issue.

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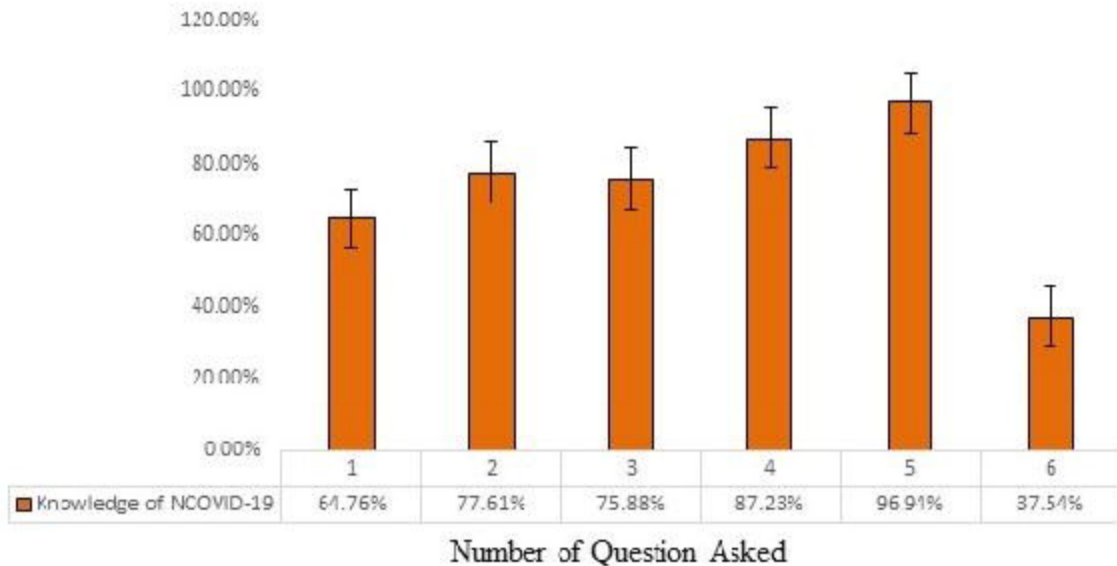
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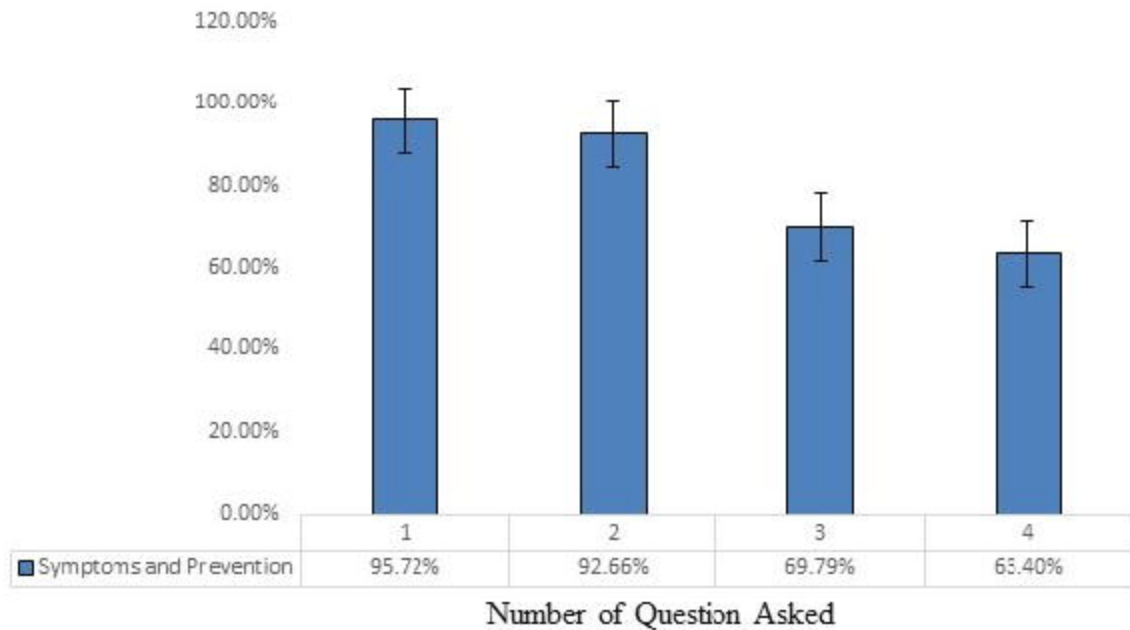


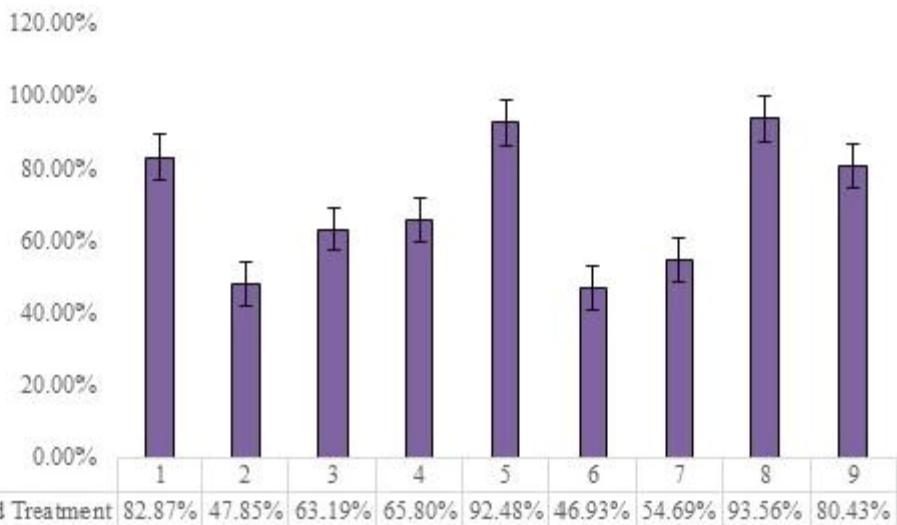
■ Knowledge of NCOVID-19

■ Symptoms and prevention of NCOVID-19

■ Infection control and treatment of NCOVID-19







Number of Question Asked