Knowledge, Attitude & Practices of Surgeons in the time of COVID-19

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Abstract

Objective: The objective of the study was to determine the knowledge, attitude and practices of surgical interns, residents and surgeons in the time of COVID-19.

Methods: A cross-sectional study was conducted on surgical interns, trainees, registrar and consultants working in public and private sector tertiary care hospitals of Karachi. Non-Convenience sampling technique is used. A total of 184 patients were included. The study was performed on assessing patients' demographics, basic knowledge and awareness of COVID 19 and individuals' practices toward COVID 19 in their professional routines. Data were stored and analyzed using IBM-SPSS version 23.0. Pearson Chi Square test was used to test the association outcomes, awareness and attitude items on COVID-19 between private and public sector hospitals. P-values less than 0.05 were considered statistically significant

Results: The study comprised a total of 184 participants. Mostly from public 115(63%) rest 69(37%) belonged private sector hospitals. Most respondents 122(66.3%) were aware of COVID 19 incubation, symptoms and the detection of patients at risk and modalities of transmission in operating rooms.Results showed among public vs Private sector hospitals (81.7% / 68.1%) were treating corona virus, there were (35.7% / 46.3%) screening and admitted the cases, (56.5% / 62.4) tentative numbers of COVID-19 cases reported range from 0-25, (40.9%/ 11.6%) surgeons were assigned additional duties for COVID -19 by hospital management found statistically significant with "p<0.01".

Conclusion: It is concluded after this study that the surgeons in Pakistan are well aware of the situation, have adequate knowledge of the risk factors and symptoms of COVID-19. But statistically, probably because of limited resources and work load, there is a substantial gap in practices between public and private sector surgeons. There is also a dire need to develop local guidelines related to preventive measures in our health care systems according to our demands and supply.

Key words: Surgeons, COVID-19, infection, incubation, transmission.

Citation: Jalil A[1], Kanwal R[2], Idrees Z[3], Khan KM[4], Naseem M[5], Kamal MS[6]. Knowledge, Attitude & Practices of Surgeons in the time of COVID-19 [Online]. Annals ASH KMDC 2021.

(ASH & KMDC 26(1):286;2021)

Introduction

The novel Corona virus also known as SARS-Cov-2 and later designated as COVID-19 was first reported in Wuhan, China in December 2019 and was declared an epidemic initially but later was officially declared as a pandemic by World health organization (WHO) on March 11, 2020. Within a short period of few months this has caused mass effects on world politics, dynamics and economy. At the time of writing this article on 12th May 2020 there are 4,255,940 confirmed cases worldwide in 215 countries and death toll of 287,3321. Several countries and states have imposed a complete lock down of all the offices, gathering places, educational institutes, public transport and restaurants in order to contain and curb further spread of corona virus[2] All health-care facilities are experiencing radical shifts in their clinical preferences during this pandemic[3].

In Pakistan, the first diagnosed case of COVID-19 appeared in February 2020. The number of reported cases in the country as of 12th May 2020 is 3,2081 with 8,555 recoveries and 706 mor-

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Date of Submission: 12th May 2020
Date of Acceptance: 25th March 2021

talities[4]. The country has been put under a nationwide lockdown until 9th May, which began on 1st April 2020[5]. Evidence has demonstrated that frequent symptom monitoring, routine testing and use of correct personal protective equipment (PPE) are some of the key steps in conquering the war with this invisible virus[6]. Even with limited resources Pakistan's government took all steps against the COVID-19 to provide and ensure the state's obligations for its citizens like special hospitals, quarantine places, awareness campaigns, screening and testing facilities[7]. Viral particles have been detected in naso-pharyngeal secretions, gastrointestinal tissue, blood, stool, surfaces in the operating rooms (OR), surgeons' shoe covers and electro cautery smoke[8]. This leads to an increased chance of COVID-19 exposure for surgical teams. Surgeons are probably not at the front liners in treating patients with COVID-19 but still are at significant risk of infection due to vast routes of virus transmission. In our opinion, how this pandemics affects surgeons lives in all over the world is not yet fully highlighted. We conducted an online survey to understand attitude and practices, problems facing by Surgeons during COVID-19 Pandemic. The main aim of this study is to document the prospective views of surgeons and residents evidently in public and private sector hospitals. We hope that this will bring a descriptive view of problems surgeons are facing right now. We think it is necessary for doctors related to surgical field also to take rigorous preventive measures and have good knowledge about COVID-19 epidemiology and transmission in order to prevent themselves and also patients from getting infected and preventing its spread. Taking all these details into account, the objective of our survey is to determine the knowledge, attitude and practices of surgical interns, trainee residents and surgeons.

Subjects and Methods

This cross-sectional study was conducted in Orthopedic Department, Abbasi Shaheed Hospital, on surgical interns, trainees, registrars and consultants working in public and private sector tertiary care hospitals of Karachi, Pakistan. Participants were included from all surgical sub-specialties and non-probability convenient sampling was employed as the sampling technique. The study was conducted online for one week from April 6, 2020 till April 13, 2020. All surgical interns, trainee residents, registrars and consultants were invited through WhatsApp, facebook and email. The invitation message contained details about the study and a consent of their voluntary participation. A total of 199 individuals responded to the invitation and were included. After exclusion of incomplete responses, a total of 184 participants were included in the final study.

Data was collected through a well-structured self-administered questionnaire developed after extensive review of literature and international guidelines. A pilot study was conducted on 15 surgical residents to rule out any ambiguity in the questionnaire. The questionnaire was developed online using google forms and a link to the questionnaire was sent to all the participants who accepted the invitation. The questionnaire was accessible to the respondents by just clicking on the link provided by the author. The survey was a multiple-choice questionnaire divided into 3 sections.

In the first part the demographic data of the participants was asked. Second part contained variables assessing the subject's basic knowledge and awareness about COVID-19 such as incubation period, symptoms, modes of corona filter protocol, risks in their work premises, and most influencing probable risk factors which facilitate spread of disease among them. One important thing addressed in this part was to get feedback on the acknowledgement of surgeons and colleagues who got infected with COVID-19 during this pandemic. Third part had questions pertaining to the attitudes of individuals to cater with COVID-19 in their daily professional routines by inquiring them about, number of surgeries performed, took PPE as per recommended standards, opted screening method, opinion regarding COVID-19 specific polymerase chain reaction (PCR) test as a baseline investigation before all surgeries, and whether they were be-

holding planned non-urgent surgeries to preserve the resources.

Data were stored and analyzed using IBM-SPSS version 23.0, Counts with percentages were given for baseline characteristics included information on age group, gender, hospital sector and specialty. Pearson Chi Square test was used to test the association outcomes, awareness and attitude items on COVID-19 between private and public sector hospitals. P-values less than 0.05 were considered statistically significant. Bar diagrams also used to give information on knowledge and practices of respondents on COVID-19.

Results

The survey comprised a total of 184 participants, which includes 27 (15%) surgical interns, 83 (45%) residents, 30 (16%) registrars, and 44 (24%) consultants from various specialties. There were 104 (57%) male and 80 (43%) female participants. The age range of the participants was 25-65 years (mean 34.6 years, SD 8.1 years). Majority of the participants were from public sector hospitals 115 (63%) while the rest 69 (37%) belonged to private sector hospitals. Most of the participants 69 (43%) were Orthopaedic residents, interns and consultants shown in table 1.

When asked about the incubation period of COVID-19 majority of the respondents 122 (66.3%) answered the correct incubation i.e. 1-14 days. Others 37 (20%) thought the incubation period to be up to 10 days followed by 20 (10.8%) doctors who considered the incubation period to be 7 days.

Regarding knowledge about the symptoms of COVID-19 and identification of patients who are at risk, most of the respondents were aware about the COVID-19 (bar diagram 1).

About the modalities of transmission for surgeons, most participants, i.e. 134 (73%) indicate that asymptomatic carriers which spread the disease during their incubation period, 131 (71%) believe that there is a lack of routine screening for patients and the surgical team, 112 (61%) of respondents agree that aerosol-generating procedures, i.e. laparoscopy, endoscopy, 105 (57%) of respondents believe body tissues, fluids and electrocautery smoke are the source of mitigation, Also 79 (43%) of respondents think high-speed tools, and just 64 (35%) recommend ventilation in the operating theatre is responsible of virus spread.

Results showed among public vs Private sector hospitals (81.7% / 68.1%) were treating corona virus, there were (35.7% / 46.3%) screening and admitted the cases, (56.5% / 62.4) tentative numbers of COVID-19 cases reported range from 0-25, (40.9%/ 11.6%) surgeons were assigned additional duties for COVID -19 by hospital management found statistically significant with $p<0.01$, in Public vs. private (29.6% / 21.7%) on average 1 - 5 surgeries were performed after emerging COVID-19 scenario, there were (29.6% /21.7%) respondents keeping in mind protective measures of COVID-19 taken any additional PPE during surgeries also found statistically significant with "$p<0.01$", Table 2.

Results of the current study showed among Public vs. Private hospitals (13% / 30.4%) hospital management understand the low priority risk for surgeons found statistically significant with "$p<0.01$", among public vs. private (29.6% / 43.5%) surgeons thought a high risk of infections during surgery, (36.5% / 24.6%) were agreed on they should do corona virus screening as baseline investigations for protection of surgeons and (14.8% / 37.7%) knew about surgical teammate got infected with this virus found statistically significant with "$p<0.01$" Table 3.

Among public vs. private hospitals (78.3% / 73.9%) thought we should save PPE for hard times by delaying elective surgeries, (44.4% / 31.8%) suggested corona screening should be opted, and (10.4% / 11.5%) surgeons were fear right now in this outbreak as uncertainty of relief. However these factors found statistically insignificant for association of public vs. private sector Table 4.

When inquired about protective tools used by the participants during surgeries, 137 (74%) claimed to use boot covers while only 29 (16%) used N-95

masks instead of surgical masks. Mass of respondents 136 (74%) was of the opinion that PPE are not sufficient for doctors in their hospitals while others have opposite opinion. Majority of surgeons 141 (76%) said that they understand this critical scenario and are in favor of delaying elective surgeries to saves resources including the hospital beds, personal protective equipment, as well as preserving the health of surgical staffs. Becoming a source to infect their own family members was the worst fear experienced by majority of 149 (81%) (Bar diagram 2).

Discussion

The surgeons are obligated to provide timely, high-quality surgical care for patients since always. In this current COVID-19 crisis, the global community is learning more about it every day. Especially surgeon's need guidance from their relevant national, local, and hospital guidelines and regulations, many of which will possibly evolve over time as new information becomes accessible to the global community[8]. In the initial phase of the COVID-19 pandemic, surgical practice data was limited but recent and ongoing evidence shows that Surgical operating theaters are high-risk areas for respiratory infection transmission despite the urgency of management, the presence of extended numbers of health staff and various aerosol generating procedures[9]. This survey offers an overview about surgeons' perspective of COVID -19 In terms of level of understanding, perception, and approach to infection control at the time of the 2020 pandemic.

We assessed surgeons' awareness by inquiring them about incubation period, positive findings and symptoms regarding identification of infected patients. In this report, more than two third of surgeons knew about disease's incubation period as compared to a study done on Jordanian dentist's, where just 36.1% accurately knew[10]. We emphasized to know the correct incubation period because of its role in deciding the appropriate management. This study also demonstrated that majority of surgeons have sufficient knowledge regarding the symptom arrays. In a previous study done with health care workers in Henan, China, physicians reported higher ratings of information compared to nurses and paramedic's period for suspected patients[11]. WHO recommends that all countries increase their readiness rates and remain more vigilant to patient identification[12].

As surgical teams are at uniquely high risk for SARS-CoV-2 exposure, it is encouraging to know that more than two third of the surgeons were aware and afraid of its contagious risk as per this study. There are many modalities of COVID-19 transmission; it generally spreads by cough, sneeze and touching contaminated surfaces[9]. However, surgeons are in a quite complex scenario as operations theaters contain multiple mediums of viral transmission including aerosols, fluids, tissues, instruments, ventilation systems and OR personals, surprisingly this demon is everywhere[8]. Asymptomatic carriers of SARS-CoV-2 may be able to spread the virus during incubation time, accounting for 1% of laboratory-confirmed cases of SARS-COV-infection[13]. In addition surgery can complicate the progression of disease in asymptomatic patients during the incubation period of COVID-19 infection, as per an article published during initial phase of this epidemic[14]. Our survey revealed that surgeons in Pakistan had adequate knowledge about its modes of transmission, but half of the most of the participants did not know that electro cautery smoke and ventilation systems are the source of mitigation too. Many guidelines have also suggested limited use of mono-electro cautery with evacuator pencils or ventilated. In addition, if accessible, negative pressure operating rooms should also be used suspected or confirmed COVID-19 positive patients[15]. American College of Surgeons has outlined main criteria for protecting surgical teams because of inherent risks and we strongly suggest adopting them to prevent catastrophic sequelae[8]. Awareness is a requirement for prevention, optimistic attitudes and constructive actions, and it influence individual's management practices much farther[16]. Hence, we believe that educational sessions must be undertaken to educate the masses about the risk of transmission of COVID-19 and re-

Table 1. Demographics of the participants (n=184)

Gender	Male	104 (57%)
	Female	80 (43%)
Age Group	25 - 35	129 (70%)
	35 - 45	35 (19%)
	45 - 55	16 (9%)
	55 - 65	4 (2%)
Designation	Interns	27 (15%)
	Resident	83 (45%)
	Registrar	30 (16%)
	Consultant	44 (24%)
Hospital Sector	Public	115 (63%)
	Private	69 (38%)
Specialty	General Surgery	67 (36%)
	Orthopedics	79 (43%)
	Plastic Surgery	11 (6%)
	Others	38 (21%)

source consumption. This outbreak recalls the significance of preparation and training before the need emerges.

In our review, results showed there is significant difference among few variables, Public sector hospitals are treating tremendous number of patients in comparison with private sector (81.7% / 68.1%) with limited resources, and about (40.9%/ 11.6%) surgeons were assigned additional duties for COVID -19 by hospital management found statistically significant with $p<0.01$ in Public vs. private hospital that also imposes incredible work burden on doctors, the most noteworthy thing is (37.7% / 14.8 %) in public vsprivate sector surgeons indicated that their workers had already been diagnosed with COVID-19 and 38% indicated exposure to multiple employees, This is, sadly, a toxic situation that has triggered anxiety, stress and depression in all respondants but public sector doctors are suffering more in our study, a retrospective study in Wuhan also identified a total of 26 orthopedic surgeons from 8 hospitals who had been infected with COVID-19. The possible contact sites were general wards, hospital public places, operating rooms, the intensive care unit and the outpatient clinic[17]. Yet, surgical care is a foundation of any health system 9, in our survey mostly surgeons agreed to perform surgeries with appropriate PPE during surgeries, while only 15% used N95 respirator masks. Centers for Disease Control, and the Chinese Journal of Surgery's latest recommendations, have explicitly proposed that N95 masks be used for emergency anesthetic and surgical equipment[18,19]. Surgeons in this survey have broad knowledge about essential patients screening before surgeries and mostly are practicing triage for fever, upper respiratory tract (URT) symptoms and contact, travel history. There are protocols which strongly advice that surgical interventions should not be performed in symptomatic COVID-19 patients[20].

Reverse transcription polymerase chain reaction RT - PCR remains the diagnostic molecular assay of COVID-19 Virus by identifying the viral RNA through nucleic acid amplification. Test sample are taken as swabs from the nasopharynx or oropharynx, nasopharynx swabs are suggested to be more sensitive. Swabs are then placed into a liquid to release viral RNA into the solution and subsequently amplified using reverse transcription-PCR. The reliability of the test relies on specimen quality and viral RNA, which may deteriorate over time. Seeing as SARS-CoV-2 may threaten anyone and lead to dissemination before the onset of symptoms or presumably sometimes without any presenting symptoms, rapid testing / screening should be considered for the safety of surgeons and OT personals, in the interim COVID-19 specific PCR should be pre-operatively tested in all surgical patients[21]. Almost (31.8% / 44.4%) respondents from public and private sector respectively in the current study documented that they are not performing surgical procedures without COVID-19 specific reverse transcription polymerase chain reaction (RT-PCR) test for the protection of themselves and their team. Lei et al. confirmed that, due to a poor understanding of the situation and the lack of SARS-CoV-2 kits at early outbreak phase caused them worst outcomes[22].

Since the start of pandemic, delays in COVID-19 testing increased erratic PPE consumption, further intensifying demand. Similarly our health care services have been documented substantial Personal protective equipment shortage, compromising

Table 2. Outcomes on COVID-19 in Public and private Sector Hospitals

Variables		Hospital Sector				p-value
		Private		Public		
		n	%	n	%	
Does your hospital	Don't Know	4	5.8	6	5.2	0.07
is treating Corona	No	18	26.1	15	13.0	
virus patient?	Yes	47	68.1	94	81.7	
If Yes, then what is the Level of treatment?	Screening & Admission	32	46.3	41	35.7	0.17
	Screening & Referral	37	53.6	74	64.3	
Tentative numbers of COVID19	0 - 25	43	62.3	65	56.5	0.33
cases reported in your hospital (including	25 - 50	12	17.4	32	27.8	
suspected and confirmed cases)	50 - 75	7	10.1	11	9.6	
	75 - 100	6	8.7	4	3.5	
	Above 100	1	1.4	3	2.6	
Are you doing any additional duties for	As a volunteer	2	2.9	3	2.6	<0.01*
COVID-19 assigned by your hospital	Assigned by Hospital Management	8	11.6	47	40.9	
management or as a volunteer?	Not doing	59	85.5	65	56.5	
Keeping in mind protective measures of	May be	6	8.7	22	19.1	<0.01*
COVID-19, have you taken any additional	No	19	27.5	59	51.3	
PPE, during the surgeries you conducted	Yes	44	63.8	34	29.6	

*p<0.05 was considered significant using Pearson Chi Square test

Table 3. Association of COVID-19 Awareness in Public and Private Sector Hospitals

Variables		Hospital Sector				p-value
		Private		Public		
		n	%	n	%	
Do you think your hospital management is	No Priority	11	15.9	49	42.6	<0.01*
understand risk for surgeons like physicians	Low Priority	13	18.8	21	18.3	
for PPEs and taking it on priority?	Moderate	12	17.4	24	20.9	
	High Priority	21	30.4	15	13.0	
	Very High Priority	12	17.4	6	5.2	
Do you think there is risk of	No Risk	0	0.0	1	0.9	0.38
infection during surgery?	Low Risk	2	2.9	4	3.5	
	Moderate Risk	4	5.8	9	7.8	
	High Risk	30	43.5	34	29.6	
	Very high risk	33	47.8	67	58.3	
Do you think we should do corona virus	Disagree	3	4.3	4	3.5	0.01*
screening as baseline investigations for	No Need	0	0.0	3	2.6	
protection of surgeons?	Neutral	17	24.6	9	7.8	
	Agreed	17	24.6	42	36.5	
	Highly agreed	32	46.4	57	49.6	
Do you know any of your surgical	Suspected Exposure	1	1.4	44	38.3	<0.01*
teammate got infected with this virus	No	42	60.9	54	47.0	
	Yes	17	14.8	26	37	

*p<0.05 was considered significant using Pearson Chi Square test

Table 4. Association of COVID-19 Attitude in Public and Private Sector Hospitals

Variables		Hospital Sector				p-value
		Private		Public		
		n	%	n	%	
Availability of PPE, ventilators and bed are at question mark nowadays, do you think we should save it for hard times by delaying elective surgeries	Maybe	12	17.4	10	8.7	0.17
	No	6	8.7	15	13.0	
	Yes	51	73.9	90	78.3	
In this COVID-19 pandemic we should do trauma surgery? If yes then what protocols you are opting?	Corona screening	22	31.8	51	44.4	0.10
	No testing just preventive measures	30	43.5	30	26.1	
	Triage	17	24.6	34	29.6	
As a Surgeon, what's your most worrisome fear right now in this outbreak?	Bring Corona in your home	54	78.3	95	82.6	0.50
	End up on ventilator	7	10.1	6	5.2	
	I Don't care	0	0.0	2	1.7	
	Uncertainty of relief	8	11.5	12	10.4	

*p<0.05 was considered significant using Pearson Chi Square test

their ability to keep health care professionals safe while treating increasing numbers of patients. Glove, face masks, N95 respirators, powered air-purifying respirators, eye protection, and gowns are essential to dissemination-based precautions, overwhelming number of respondents in our study are well aware about the constraint resources and our dubious infrastructure and agreed about the shortage of personal protective equipment. Furthermore, non -urgent procedures should also be prioritized by surgical teams, healthcare facilities and clinicians. These efforts will maintain supplies of PPE and medical care ensure staff and patient safety and increase the hospital resources available. Several recommendations offer adequate input into avoiding both elective and non-urgent surgical procedures[9]. Our surgeons in both public and private sectors thoroughly understand this prospective too and have therefore reduced the number of surgeries and are also in favor of delaying non-urgent surgeries. American College of Surgeons, recommends the same that, careful planning and appropriate PPE are essential, but the most effective way to prevent viral exposure is to avoid non-essential surgical procedures to reduce the risk of exposure for patients and health professionals, preserves personal protective equipment, and strengthens health care system resources[8]. Hundreds of Pakistani doctors working on the frontline are affected directly by the dangerous corona virus after coming into contact with patients. Several hospitals of Pakistan reported chaotic situation, health care professionals contracted corona virus infection, most are either hospitalized or in quarantine[23]. Respondents in our analysis showed that hospital management does not adequately understand the risk to surgeons, like physicians, and mostly surgeons are not satisfied with the management, particularly in the public sector. Meanwhile, health care professionals endure physical irritation and at occasions breathing problems while wearing personal protective gear (PPE), which is aimed to keep them protected from viral exposure. An even more significant challenge facing by health care workers is that since there is little known about this new and rapidly evolving pathogen, and no evidence - based guidelines or clinical treatments are prevalent, several HCPs feel unprepared to carry out their responsibilities. And then there's a quite legitimate concern of auto inoculation and the possibility of spreading the virus to families and friends around. This apprehension prompts HCPs to isolate themselves from their families, modify their daily routines, and even minimize their social interaction, just in the exchange for keeping others protected from them.Even though they are willing to do their duties in the face of extreme uncertain fear but majority of them in our study are really worried about becoming carrier to

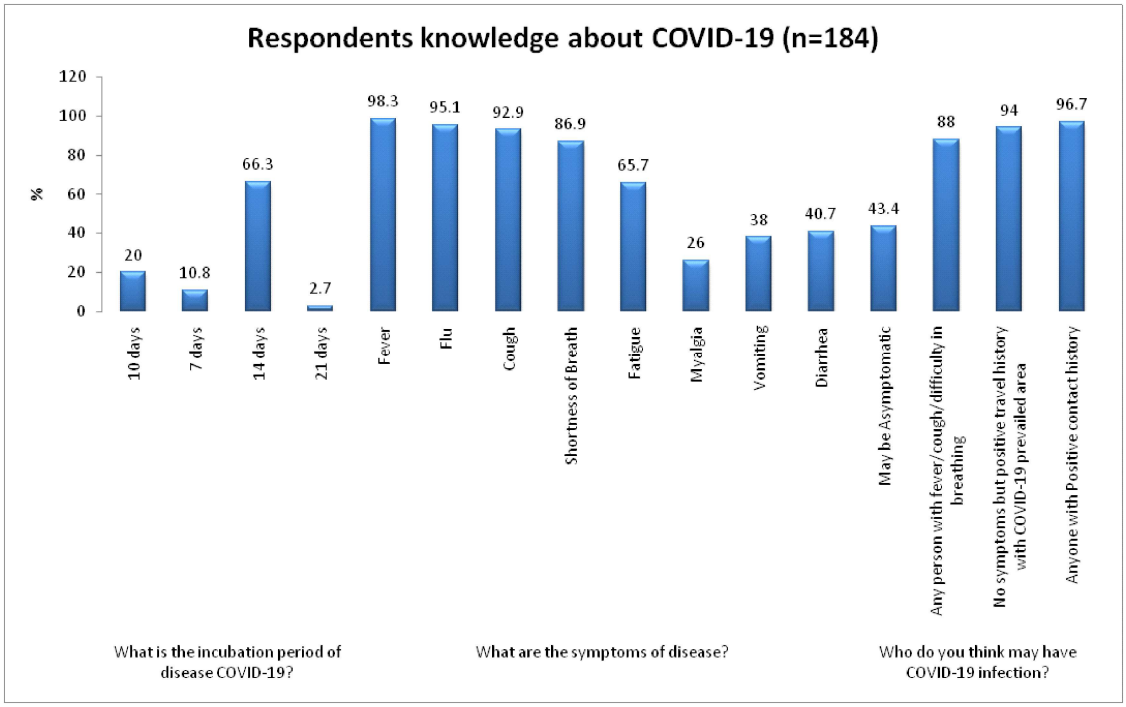

Fig 1. Respondents knowledge about COVID-19 (n=184)

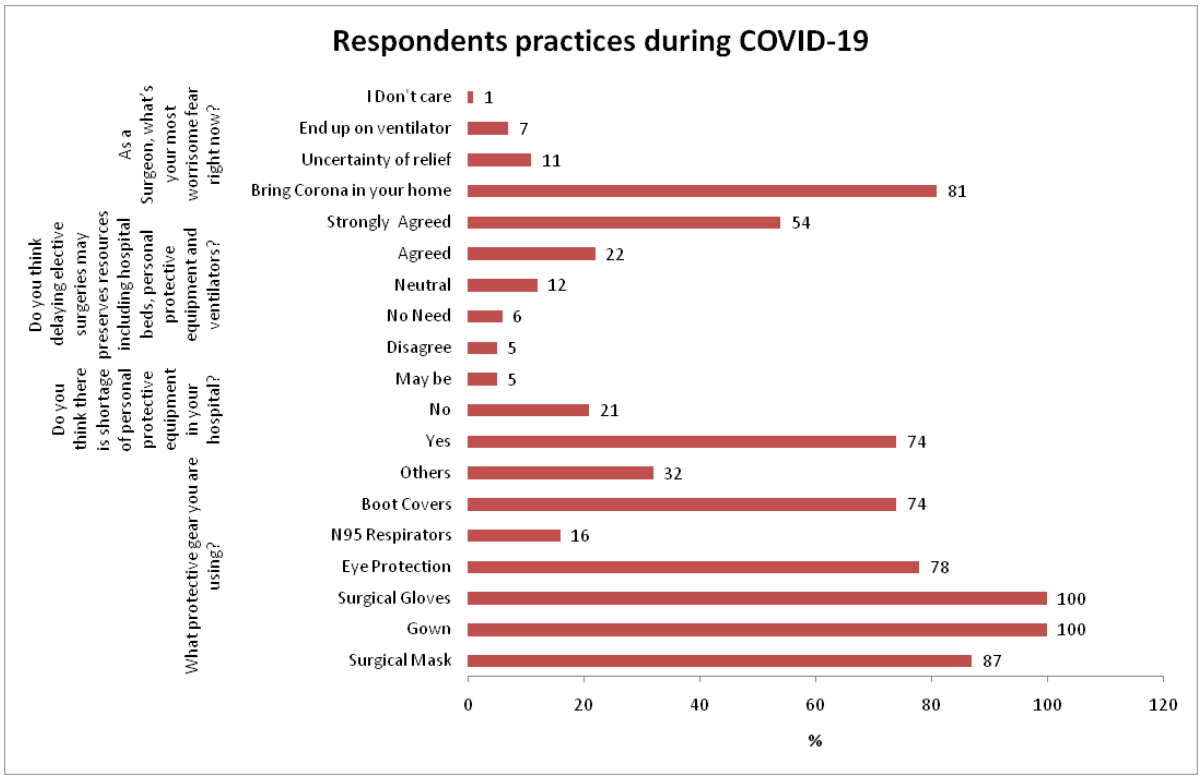

Fig 2. Respondents practices during COVID-19

infect their family members which impacts psychological and mental health[24].

The research does, however, have some drawbacks that should be recognized. It is a cross-sectional study undertaken online among surgeons and trainees in the first week of April 2020 when the number of cases is still increasing worldwide, and more and more information related to COVID-19 is being added each day. In addition, the data provided in this study is self-reported and based in part on the integrity and recall ability of the respondents. It may be subject to prejudice in the recall. Finally, the ethical review board was not consulted due to the closure of educational institutions during the COVID-19 outbreak. Yet our observations provide useful information on surgeons' awareness and adaptation in this uncertain pandemic. The results show that the surgeons in Pakistan are well aware of the situation, have adequate knowledge of the risk factors and symptoms of COVID-19, and are prepared to delay surgical procedures whenever they can to control the spread of COVID-19. We think ample awareness about, early preventive measures including specialized triage protocols; resource management and extreme flexibility within the healthcare system are required to save as many casualties as possible. But it is equally important to develop local guidelines related to preventive measures in our health care systems according to our demands and supply. As the infection is still rapidly increasing internationally as well as in Pakistan, there is need for the entire health care community to be proactive rather than reactive.It is predicted that there will be negative mental health implications, which will last long after the pandemic has ended. Despite the fact that international agencies and other national, and local agencies are constantly attempting to provide accurate and frequent information about the disease, the influx of continuous information, misinformation, or lack of necessary information is a major problem. And to achieve this, further studies are warranted in near future to assess the situation, so that necessary steps to increase awareness and setting up of guidelines can be taken in a timely manner.

Conclusion

The results show that the surgeons in Pakistan are well aware of the situation, have adequate knowledge of the risk factors and symptoms of COVID-19, but there is significant difference of practices between public and private sector doctors statistically, specifically due to limited resources and work load.Therefore efforts should be made to ensure adequate supplies of Personal protective equipment for doctor and staff safety and increase the hospital resources. Also we need to develop local guidelines and standard operating protocols with respect to surgical practice in the country.

References

1. WHO Coronavirus disease (COVID-19) Pandemic.2020 [Internet].[cited 12 May 2020]. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019.
2. B.B.C. News. Coronavirus: The world in lockdown in maps and charts [Internet]. [cited on 7 April 2020]Available from: https://www.bbc.com/news/world-52103747.
3. Naspro R, Da Pozzo LF. Urology in the time of corona. Nat Rev Urol 2020; 17:251-253. [DOI: 10.1038/s41585-020-0312-1]
4. Coronavirus in Pakistan - Confirmed Cases. [cited on12 May 2020] Available from: www.covid.gov.pk/. Accessed on 11 November 2020.
5. Shehzad R. Countrywide lockdown stretched till May 9[Internet]. The Express Tribune. [accessed on 11 November 2020, cited on 25 April 2020]. Available from: https://tribune.com.pk/story/2206167/countrywide-lockdown-stretched-till-may-9. 6.Ti LK, Ang LS, Foong TW, Ng BSW. What we do when a COVID-19 patient needs an operation: operating room preparation and guidance. Can J Anaesth 2020; 67:756-758. [DOI: 10.1007/s12630-020-01617-4]
7. Waris A, Khan AU, Ali M, Ali A, Baset A. COVID-19 outbreak: current scenario of Pakistan [Internet]. New Microbes and New Infections 2020; 35:100681.Avaialble from: https://www.sciencedirect.com/science/article/pii/S2052297520300330. Accessed on: 11 November 2020. [DOI: 10.1016/j.nmni.2020.100681]
8. Brat GA, Hersey SP, Chhabra K, Gupta A, Scott J. Protecting Surgical Teams During the COVID-19 Outbreak: A Narrative Review and Clinical Considerations. Ann Surg 2020; 10.1097/SLA.0000000000003926. [DOI: 10.1097/SLA.0000000000003926]
9. Brindle M, Gawande A. Managing COVID-19 in Surgical Systems. -Ann Surg 2020; 271:e1-e2.[DOI: 10.1097/SLA.0000000000003923]
10. Khader Y, Al Nsour M, Al-Batayneh OB, Saadeh R, Bashier H, Alfaqih M. et al. Dentists' Awareness,

Perception, and Attitude Regarding COVID-19 and Infection Control: Cross-Sectional Study Among Jordanian Dentists. JMIR Public Health and Surveill 2020;6:e18798. [DOI:10.2196/18798]

11. Zhou M, Tang F, Wang Y, Nie H, Zhang L, You G, et al. Knowledge, attitude and practice regarding COVID-19 among health care workers in Henan, China.J Hosp Infect 2020; 105: 183-187.[DOI: 10.1016/j.jhin.2020.04.012].
12. W.H.O.Europe. Coronavirus disease (COVID-19)outbreak [Internet]. Available from:www.euro.who.int › who-announces-covid-19-outbreak-a-pandemic. Accessed on: 11 November 2020.
13. Bai Y. Yao L. Wei T. et al. Presumed asymptomatic carrier transmission of COVID-19 [Internet]. JAMA 2020; 323:1406-1407.Available from: https://jamanetwork.com/journals/jama/article-abstract/2762028. Accessed on: 11 November 2020. [DOI: 10.1001/jama.2020.2565]
14. Lei S, Jiang F, Su W, Chen C, Chen J, Mei W, et al. Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection. E Clinical Medicine 2020; 21:100331. [DOI: 10.1016/j.eclinm.2020.100331]
15. Pryor A. Sages and eaes recommendations regarding surgical response to covid-19 crisis [Internet]. Available from: https://www.sages.org/recommendations-surgical-response-covid-19/. Accessed on: 11 November 2020.
16. McEachan R, Taylor N, Harrison R, Lawton R, Gardner P, Conner M.Meta-Analysis of the Reasoned Action Approach (RAA) to Understanding Health Behaviours .AnnBehav Med 2016; 50:592-612. [DOI: 10.1007/s12160-016-9798-4]
17. Gu MD, Yang Wang MD, Jingjing Zhao MD, Lian Zeng MD. The Orthopaedic Forum Survey of COVID-19 Disease Among Orthopaedic Surgeons in Wuhan, People's Republic of China. J Bone Joint Surg Am 2020; 102:847-854. [DOI: 10.2106/JBJS.20.00417]
18. Centers for Disease Control and Prevention. Personal protective equipment:questions and answers [Internet]. CDC USA; 2020 [cited on 18 March 2020]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html.
19. Kaixiong T, Bixiang Z, Peng Z, et al. Recommendations for general surgery clinical practice in novel coronavirus pneumonia situation. Chinese Journal of Surgery 2020;58:E001. [DOI: 10.3760/cma.j.issn.0529-5815.2020.0001].
20. Centre for Disease Control USA.Interim infection prevention and control recommendations for patients with suspected or Confirmed Coronavirus disease 19 (COVID-19) in healthcare settings [Internet]. [Updated 4 November 2020] Available at:https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html. Accessed on: 11 November 2020.
21. Liu Z, Zhang Y, Wang X, Zhang D, Diao D, Chandramohan K, et al. Recommendations for Surgery During the Novel Coronavirus (COVID-19) Epidemic. Indian J Surg 2020; 1-5. [DOI: 0.1007/s12262-020-02173-3]
22. Al-Muharraqi MA. Testing Recommendation for COVID-19 (SARS-CoV-2) in Patients Planned for Surgery-Continuing the Service and 'Suppressing 'the Pandemic. Br J Oral MaxillofacSurg 2020; 58:503-505. [DOI:10.1016/j.bjoms.2020.04.014]
23. Ahmed A. COVID-19: Panic in hospitals as nearly 400 healthcare workers contracted coronavirus in Pakistan [Internet]. Gulf News. Available from: https://gulfnews.com/world/asia/pakistan/covid-19-panic-in-hospitals-as-nearly-400-healthcare-workers-contracted-coronavirus-in-pakistan-1.71232231#. Accessed on: 11 November 2020.
24. Rana W, Mukhtar S. Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. Asian J Psychiatr 2020; 51:102080. [DOI: 10.1016/j.ajp.2020.102080]

Answer of Picture Quiz

Diagnosis: Ossifying Fibroma