ATTITUDE OF ANESTHESIOLOGY SPECIALISTS AND RESIDENTS TOWARDS PATIENTS INFECTED WITH THE NOVEL CORONAVIRUS (COVID 19) IN TERTIARY CARE HOSPITALS OF KARACHI

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Abstract

OBJECTIVE: *To assess the attitude of anesthesiologists towards airway management in COVID 19 patients.*

METHODOLOGY: *This cross-sectional research is scheduled for execution in 2024 within the Anaesthesiology Department of the Indus Hospital, Karachi, with an enrollment of 157 anesthesiologists. Eligible participants were anesthesia residents and specialists who worked in tertiary care hospitals, aged 20-70 years, of either gender, to assess the assess their attitude towards airway management in COVID 19 patients. Data will be entered and analyzed by SPSS version 26. escriptive statistical analyses were conducted, and the data underwent rigorous examination to produce results with a confidence interval of 95%.*

RESULTS: *The investigation encompassed a cohort of 157 anesthesiologists, exhibiting a mean age of 35.24± 6.98 years; male participants constituted 54.1% of the sample, while female participants represented 45.9%. A considerable proportion of the participants possessed less than five years of professional experience and were employed in private healthcare institutions. Although 66.9% indicated the presence of formal COVID-19 protocols, merely 46.5% had undergone training in airway management. Attitudinal responses exhibited significant variability in relation to gender, type of hospital, training received, and the availability of protocols, with 87.9% demonstrating a favorable disposition towards airway management concerning COVID-19.*

CONCLUSION: *The majority of anesthesiologists in tertiary hospitals located in Karachi exhibited an affirmative disposition towards the management of patients afflicted with COVID-19, particularly in relation to airway management. Nevertheless, those practitioners possessing formal training or employed within public healthcare facilities demonstrated an increased likelihood of expressing apprehensions—potentially attributable to an elevated awareness of risk factors. These findings underscore the necessity for educational initiatives that enhance both competencies and self-efficacy, in conjunction with improved institutional support mechanisms.*

INTRODUCTION

On January 12, 2020, the World Health Organization (WHO) officially identified a novel coronavirus as the causative agent of respiratory illness in the city of Wuhan, China, thus declaring a global public health emergency [1,2]. Subsequently, on March 11, 2020, it was classified as a pandemic, with a significant number of individuals infected worldwide [2]. This number has now escalated to 422,228,279 at the time of this writing. In Pakistan, the initial cases of COVID-19 were recorded on February 26, 2020, with only two cases reported [3], which later surged to over one million infections, resulting in 23,000 fatalities to date [4]. The transmission of the disease occurs either directly or through the inhalation of respiratory droplets or aerosols emitted from infected individuals [5]. As of mid-January 2020, approximately 21% of global coronavirus cases were among healthcare workers [6]. In the context of critical care, anesthesiologists represent a primary specialization tasked with managing patients who are hemodynamically unstable or in need of ventilatory support due to acute respiratory distress syndrome (ARDS) caused by SARS-CoV-2, necessitating their involvement in patient care to alleviate the burden of disease [7]. Numerous studies indicate an increasing prevalence of healthcare workers (HCWs) contracting COVID-19, with infection rates ranging from 15% to 18%, and even reaching 20% in certain regions of the population [5,8-10]. The risk of aerosolization during aerosol-generating procedures is of particular concern. Such procedures encompass endotracheal intubations, suctioning, extubations, respiratory therapies, cardiopulmonary resuscitation, high-flow oxygen therapy (HFOT), noninvasive ventilation (NIV), and invasive ventilation [8-10]. Anesthesia providers are at an elevated risk of exposure to contamination. The significance of infection control measures for these practitioners cannot be overstated [9,11]. A study conducted by Dost et al. reported that 92.3% of residents and 94.9% of specialists strongly concurred on the necessity of adhering to proper protocols during donning and doffing of personal protective equipment (PPE). Furthermore, 81.2% of residents and 88.6% of specialists agreed that N95/FFP2 or N99/FFP3 masks should be utilized during procedures that may induce aerosolization. Additionally, 74.4% of residents and 74.3% of specialists affirmed the need for highly efficient hydrophobic filters to be installed between the anesthetic circuit and the face mask. Moreover, 47% of residents and 61.1% of specialists indicated that local anesthesia should be preferred when feasible. Conversely, only 17.9% of residents and 17.7% of specialists agreed that individuals performing intubation on suspected or confirmed COVID-19 cases should undergo a 14-day quarantine. Lastly, 38.5% of residents and 48% of specialists concurred that rapid sequence induction with 100% pre-oxygenation should be executed, while manual ventilation should be avoided [7]. In light of these considerations, we undertook the present study to elucidate the issue and address it comprehensively by evaluating the knowledge of COVID-19 among specialists and residents within the Department of Anesthesiology in Karachi, along with their attitudes towards patients diagnosed with COVID-19. As previously delineated, COVID-19 represents a formidable airborne droplet infection, and given the increasing number of infected individuals within healthcare facilities, it is prudent to incorporate guidelines and algorithms that facilitate the accommodation of patients afflicted with COVID-19. We aspire that the findings of this study will contribute to the enhancement of health services provided to COVID-19 patients concerning the recommended procedures [8] and foster greater awareness regarding this disease.

METHODOLOGY

This cross-sectional study assessed the mindset of anesthesiology specialists and residents regarding COVID-19 infected patients in tertiary care hospitals in Karachi (The Indus Hospital, Aga Khan University Hospital, Civil Hospital Karachi, Jinnah Hospital Karachi, Liaquat National Hospital and PNS Shifa) aiming at safety of patients. This study was conducted at Department of Anaesthesia, Indus Hospital during the period of six months between January 2023 to July 2023. Non-probability, convenient sampling was used for the selection of a total of 157 participants. Anesthesia residents and specialists aged 20 -70 years were included working in tertiary care hospitals with provided consent to be part of the study.

The participants were identified based on inclusion criteria, which required them to have been working in tertiary care hospitals for at least six months. Anesthesiologists with less than four years of clinical practice or who did not consent were excluded from the study. The study sought to obtain permission from the chairperson/in-charge of the anesthesia department in various hospitals, including Indus Hospital, Aga Khan University Hospital, Civil Hospital Karachi, Jinnah Hospital Karachi, Liaquat National Hospital, and PNS Shifa, prior to administering the survey. Once permission was obtained, the principal investigator (PI) approached eligible anesthesiologists and explained the study's objective. Those who agreed to participate provided verbal consent before being given a printed self-administered questionnaire.

The questionnaire contained 10 questions designed to evaluate the participants' attitudes towards COVID-19 patients. Each question had five response options, ranging from strongly agree to strongly disagree. The attitude was classified as positive if the total score from the questionnaire exceeded the median score. The data collected included demographic details such as age, gender, clinical practice area, type of institution, years of experience, and whether formal protocols for managing COVID-19 in the operating room (OR) were in place. Additionally, information about any specific training on airway management for COVID-19 cases in the operating room and whether pre-operative COVID-19 testing was performed at the facility was recorded. The collected data was entered and analyzed through SPSS version 26. Descriptive statistics were calculated for quantitative and qualitative variables in terms of mean ± standard deviation and frequency with percentage respectively. The Chi-square test was applied with a 5% level of significance.

RESULTS

The foundational characteristics of the participants in this investigation (n=157) reveal an average age of 35.24 ± 6.98 years, with 72.0% (n=113) classified within the age bracket of 28-40 years, whereas 28.0% (n=44) exceed 40 years of age. In relation to professional experience, 66.9% (n=105) possess less than 5 years of experience, 25.5% (n=40) have between 5-9 years, and 7.6% (n=12) have accumulated

10-20 years of experience. The distribution of gender indicates that 54.1% (n=85) are male, in contrast to 45.9% (n=72) who are female. Concerning the type of institution, 24.2% (n=38) are employed in public hospitals, while a predominant 75.8% (n=119) are affiliated with private hospitals. The primary areas of clinical practice encompass Operating Room & Non-Operating Room Anesthesia (87.3%, n=137), succeeded by Obstetric Anesthesia (5.1%, n=8), Critical Care (3.8%, n=6), and Regional and Acute Pain (3.8%, n=6). With respect to formal training in managing COVID-19 within the operating room environment, 66.9% (n=105) indicated the existence of a clearly defined formal protocol, while 33.1% (n=52) adhered to a partially defined or informal protocol. When queried about whether they had received training regarding airway management for COVID-19 in the operating room, 46.5% (n=73) responded affirmatively, whereas 53.5% (n=84) stated that they had not received any form of such training. Pertaining to preoperative COVID-19 testing, 21.0% (n=33) reported testing for all surgical and procedural cases, 32.5% (n=51) conducted testing exclusively for cases deemed to be at high risk of aerosolization, 34.4% (n=54) tested patients exhibiting COVID-19 symptoms or a history of close contact, while 12.1% (n=19) expressed uncertainty regarding the testing protocol as shown in TABLE I.

The examination of the attitudes of anesthesiologists in relation to study participants (n=157) indicated notable correlations with various demographic and clinical variables. Among the total of 157 participants, 138 (87.9%) manifested a favorable attitude towards anesthesiology, whereas 19 (12.1%) exhibited an unfavorable attitude. The average age of participants demonstrating a positive attitude was 35.65 ± 7.19 years, in contrast to a mean age of 32.26 ± 4.20 years for those with a negative attitude, revealing a statistically significant difference (p=0.047). In terms of gender distribution, all male participants (n=85, 61.6%) displayed a positive attitude, while all individuals expressing a negative attitude were female (n=19, 100.0%) (p=0.000). The duration of professional experience did not yield a statistically significant variation in attitudes (p=0.318), with 65.2% (n=90) of participants with a positive attitude possessing less than five years of experience, in comparison to 78.9% (n=15) of those with a negative

attitude. Nevertheless, the category of the institution demonstrated a significant correlation with attitudes (p=0.000), as all participants affiliated with public hospitals (n=19, 100.0%) displayed a negative attitude, while those associated with private hospitals (n=119, 86.2%) exhibited a positive attitude. Regarding clinical practice domains, 87.0% (n=120) of individuals with a positive attitude were engaged in Operating Room & Non-Operating Room Anesthesia, while 89.5% (n=17) of those with a negative attitude were similarly situated in this domain (p=0.405). No significant disparities were identified among practitioners in Obstetric Anesthesia, Critical Care, or Regional and Acute Pain. Formal education pertaining to the management of COVID-19 within the operating room was significantly linked to attitudes (p=0.000), as all participants with a negative attitude (n=19, 100.0%) adhered to a well-defined formal protocol, while 62.3% (n=86) of those with a positive attitude

similarly followed a formal protocol. Likewise, training in airway management specific to COVID-19 was significantly associated with attitudes (p=0.000), as all participants exhibiting a negative attitude (n=19, 100.0%) had undergone training, in contrast to 39.1% (n=54) of those with a positive attitude. Preoperative COVID-19 testing protocols also demonstrated a significant association with attitudes (p=0.000). Among participants with a positive attitude, 23.9% (n=33) conducted testing for all surgical and procedural cases, 37.0% (n=51) performed testing solely for high-risk aerosolization cases, and 25.4% (n=35) tested patients exhibiting COVID-19 symptoms or a history of close contact. None of the participants with a negative attitude engaged in testing for all surgical cases, and 13.8% (n=19) of those with a positive attitude expressed uncertainty regarding preoperative testing protocols, as illustrated in TABLE II.

Table I: Baseline Characteristics Study Participants (n=157)	
Variable	**n (%)**
Age (Mean ± SD) = 35.24 ± 6.98 years	
28-40 years	113 (72.0)
>40 years	44 (28.0)
Years of Experience	
< 5 Years	105 (66.9)
5 – 9 Years	40 (25.5)
10 – 20 Years	12 (7.6)
Gender	
Male	85 (54.1)
Female	72 (45.9)
Type of Institute	
Public Hospital	38 (24.2)
Private Hospital	119 (75.8)
Clinical Practices Area	
Operating Room & Non-Operating Room Anesthesia	137 (87.3)
Obstetric Anesthesia	8 (5.1)
Critical Care	6 (3.8)
Regional and Acute Pain	6 (3.8)
Formal Training for Managing Covid-19 in Operating Room	
Well Defined Formal Protocol	105 (66.9)
Partially Defined/Informal Protocol	52 (33.1)
Received any Training Regarding Airway Management of Covid-19 in Operating Room	
Yes	73 (46.5)
No	84 (53.5)
Preoperative Covid-19 Testing	
All surgical and procedural cases	33 (21.0)

Some surgical and procedural cases (high risk of aerosolization)	51 (32.5)
Patients with some COVID-19 symptoms or covid-19 close contact	54 (34.4)
I don't know	19 (12.1)

Table II: Comparison of Attitude of Anesthesiologists with Study Participants (n=157)		Attitude			P-Value
Demographic and Clinical Factors		**Positive (n=138)**	**Negative (n=19)**	**95% C. I**	
Age in years, Mean ± SD		35.65 ± 7.19	32.26 ± 4.20	-6.733 ⁓ -0.045	0.047
Gender	Male, *n* (%)	85 (61.6)	0 (0.0)	1.183 ⁓ 1.560	0.000
	Female, *n* (%)	53 (38.4)	19 (100.0)		
Year of Experience	<5 Years, *n* (%)	90 (65.2)	15 (78.9)	0.756⁓5.689	0.318
	5 – 9 Years, *n* (%)	36 (26.1)	4 (21.1)		
	10 – 20 Years, *n* (%)	12 (8.7)	0 (0.0)		
Type of Institute	Public Hospital, *n* (%)	19 (13.8)	19 (100.0)	0.364⁓0.687	0.000
	Private Hospital, *n* (%)	119 (86.2)	0 (0.0)		
Clinical Practices Area	Operating Room & Non-Operating Room Anesthesia, *n* (%)	120 (87.0)	17 (89.5)	0.589⁓4.099	0.405
	Obstetric Anesthesia, *n* (%)	6 (4.3)	2 (10.5)		
	Critical Care, *n* (%)	6 (4.3)	0 (0.0)		
	Regional and Acute Pain, *n* (%)	6 (4.3)	0 (0.0)		
Formal Training for Managing COVID-19 in Operating Room	Well Defined Formal Protocol, *n* (%)	86 (62.3)	19 (100.0)	0.749⁓0.896	0.000
	Partially Defined/Informal Protocol, *n* (%)	52 (37.7)	0 (0.0)		
Received any Training Regarding Airway Management of Covid-19 in Operating Room	Yes, *n* (%)	54 (39.1)	19 (100.0)	0.646⁓0.848	0.000
	No, *n* (%)	84 (60.9)	0 (0.0)		
Preoperative Covid-19 Testing	All surgical and procedural cases	33 (23.9)	0 (0.0)	0.236⁓0.753	0.000
	Some surgical and procedural cases (high risk of aerosolization)	51 (37.0)	0 (0.0)		
	Patients with some COVID-19 symptoms or covid-19 close contact	19 (100.0)	35 (25.4)		
	I don't know	19 (13.8)	0 (0.0)		

P-Value = Level of Significance, 95% C.I. = Confidence Interval

DISCUSSION

The COVID-19 pandemic posed a high-risk, frontline challenge for anesthesiologists as they had to perform many aerosol generating procedures such as endotracheal intubation, extubation and mechanical ventilation. Neither procedure provides risk-free opportunity for viral transmission, especially characteristic for resource limited settings, making it crucial to determine provider attitudes and preparedness to prevent HCW infection. A study designed for exploring the attitudes of anesthesiology residents and specialists toward airway management in COVID-19 patients, emphasizing training and institutional readiness and its association with possible demographic factors.

Most of the respondents reported a positive attitude toward dealing COVID-19 patients. In contrast, positive associations were noted on multiple logistics with gender, hospital-type, training and institutional-protocol. Interestingly, all of the respondents who reported a negative attitude were female (p = 0.000), and all respondents who came from public hospitals reported negative attitudes as opposed to respondents from private hospitals. This indicates the significant impact of institutional resources and support systems, as well as gender dynamics and disparities, on attitudes.

Interestingly, all respondents with a negative attitude had received formal training in COVID-19 airway management, whereas the majority with a positive attitude had not. This paradox may be due to increased risk awareness after formal training, highlighting the need for balanced training programs that not only enhance skills but also boost provider confidence and psychological readiness. A similar concern was raised by Paul et al., who found knowledge gaps and anxiety among healthcare workers regarding infection risk and procedural safety [12].

The relationship between institutional preparedness and attitude was also significant. Respondents who reported having defined protocols and preoperative COVID-19 testing were more likely to demonstrate a positive attitude. This supports findings by Morcuende et al., who emphasized the role of structured infection control policies in improving confidence among anesthesiologists and intensive care providers during the pandemic in New York [13].

Our findings are in line with those of Dost et al., who also reported a generally positive attitude among anesthesiologists, along with strong agreement on infection control measures such as PPE usage and the need for hydrophobic filters in anesthetic circuits [7]. Our findings are also consistent with the experience of anesthesiologists in China, where Zhang et al. described a proactive and coordinated national response that prioritized anesthesiologist training and infection control [14]. In contrast, many anesthesiologists in Pakistan—particularly in public sector institutions—reported a lack of clear guidelines and limited training opportunities, contributing to negative attitudes.

Furthermore, the emergence of new viral variants and the potential for reinfection continue to be major concerns. Ahmad et al. highlighted the challenge of managing suspected reinfections in Pakistan, indicating a need for ongoing updates in protocol and provider education [15]. In line with this, Aslam et al. stressed the importance of accurate case prediction models to prepare healthcare systems for future outbreaks [16]. These insights further support the need for adaptable, forward-looking training and response strategies within anesthesia departments.

While this study added a considerable local knowledge base, it is not without its limitations. Generalizability is limited by the fact that non-probability, convenience sampling was used to recruit participants from six tertiary hospitals in Karachi. Limitations include potential response bias due to dependence on self-administered questionnaires and scoring attitude as positive vs. negative based on a median score may oversimplify complex professional views. The study also did not consider changes over time in the attitudes that can shift along with changing guidelines, outbreaks of variants, and strain on the healthcare system.

A future study should include a larger, representative sample through probability sampling at multiple healthcare settings such as within secondary and rural hospitals. It could be that the time series nature of our estimates would be better suited to longitudinal designs in which attitude change could be measured as new training programs, rollout of vaccines or new viral variants arise. Third, qualitative studies could provide novel perspectives on the concerns, motivations, and barriers faced by providers.

CONCLUSION

The majority of anesthesiologists in tertiary hospitals located in Karachi exhibited an affirmative disposition towards the management of patients afflicted with COVID-19, particularly in relation to airway management. Nevertheless, those practitioners possessing formal training or employed within public healthcare facilities demonstrated an increased likelihood of expressing apprehensions—potentially attributable to an elevated awareness of risk factors. These findings underscore the necessity for educational initiatives that enhance both competencies and self-efficacy, in conjunction with improved institutional support mechanisms.

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