

Research Article

Impact of COVID-19 on Laboratory Health Staff in an Indian Tertiary Care Hospital

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Abstract

Background: The COVID-19 pandemic has resulted in significant burdens globally. Healthcare workers (HCWs), at the heart of the unparalleled crisis of COVID-19, face challenges treating patients and doing testing for COVID-19: reducing the spread of infection; developing suitable short-term strategies; and formulating long-term plans. We aimed to assess the psychological impact of COVID-19 on Laboratory health staff.

Material and methods: Between February - March 2021, 72 laboratory staff workers of a tertiary care teaching hospital were invited to fill out a questionnaire regarding concerns and worries about the novel coronavirus pandemic, along with a coping scoring system and General health questionnaire level (GHQ-12) survey.

Results: Out of 72 laboratory health staff who completed the survey questionnaire, 10 were faculty members, 17 were residents (including senior residents, junior residents, and demonstrators), 39 were lab technicians, followed by 4 were attendants and 2 were data operators. Laboratory staff workers with an age group range from 30 years - 60 years had a higher level of depression symptoms than respondents with 20 years - 29 years of age. Similarly, the symptoms of anxiety were noted to be significantly higher among female respondents and respondents with age >30yrs. The most frequent concern was transmitting the infection to family than to themselves only. A considerable number of laboratory staff workers utilized online psychological resources to deal with their psychological distress.

Conclusion: The findings of this survey recognize the various problems faced by laboratory health workers during the period of COVID-19 which affect their working ability. Therefore, in the future, we have to implement such strategies that enhance the performance of laboratory workers, boost their energy level, and encourage them to take care of themselves, in times of such crisis.

Introduction

There is a new public health crisis threatening the world with the emergence and spread of the 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1,2]. After causing significant morbidity and mortality in China, by February 2020, COVID-19 had spread to numerous other countries [1-3]. Health and Social Care Workers (HSCWs) continue to play a vital role in our response to the COVID-19 pandemic [4]. Health and Social Care Workers (HSCWs) have carried a heavy burden during the COVID-19 crisis and, in the challenge to control the virus, have directly faced its consequences [4,5].

The role of laboratory medicine in times of an infectious disease outbreak has been widely established [6]. Literature review contributes to the fact that the etiological diagnosis

of COVID-19, was not possible without laboratory services, either by detecting the pathogen in biological samples with reverse transcriptase-polymerase chain reaction (RT-PCR), or by quantifying antibody response immunologically [7]. COVID-19 posed a significant threat by presenting several challenges. These included inadequate availability of human resources, transportation issues, lack of Personal Protective Equipment (PPE), delayed delivery and sometimes unavailability of essential supplies, deteriorating revenue targets, health-related problems of the employees, and most importantly, a growing fear and anxiety amongst the frontline staff. Despite all these challenges, the laboratory professionals provided the best possible diagnostic support to the clinicians in this public health crisis [8].

This survey aimed to analyze the lab professionals'

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perspectives serving at the pathology laboratory, in terms of the challenges, financial implications, fears, motivation level, and satisfaction from organizational processes and policies adopted, amid the COVID-19 crisis.

Material and methods

This study utilized a cross-sectional survey design and was conducted in the Department of Pathology and Laboratory Medicine, from February 2021 – March 2021, when there was no spread of the pandemic in our hospital. The survey was administered online via the google docs survey tool, to elicit information about social and financial well-being, stress due to the COVID-19 pandemic, and satisfaction with organizational policies and practices among medical laboratory professionals.

A team designed the survey questionnaire with discussions on COVID-19 and its impact on the personal and professional lives of laboratorians. With the laboratory staff's inherent time constraints in mind, the survey was structured in such a way that it did not consume much time of a participant's time. It consisted of various items grouped into three sections. The initial section consisted of demographics with a description of their role in the lab, experience, and educational level. The next two sections included measuring the effective and ineffective ways of coping with a stressful life event and assessing the psychological strains and mental health. These were more oriented toward the social, mental, and financial impact of COVID-19 on the employees alongside their satisfaction and awareness of organizational policies, practices, and measures taken amid the pandemic emergency, adequacy of resources, and extent of training. The questionnaire was then self-administered using google docs online. An email requesting participation was sent to all the full-time lab professionals including faculty, residents, technologists, data operators, and housekeeping staff serving the Pathology department ($n = 72$).

Participation in the survey was completely voluntary and any person can opt out and withdraw by not submitting the answers. To ensure confidentiality any personal details including email ids that might lead to identification of the personnel were not acquired as part of the survey.

Results

This survey presents data from 72 lab professionals at varying stages in their professional careers in the department of pathology who completed the survey questionnaire.

Demographic characteristics

Most of the respondents were in the 3rd-4th decade of life. Respondents were predominantly female in the ratio of male to female was 1:7. Out of 72 laboratory staff workers, 10 were faculty members, 17 were residents (including

senior residents, junior residents, and demonstrators), 39 lab technicians, 4 were attendants and 2 were data operators as shown in Table 1. Laboratory staff workers with an age group range from 30 years - 60 years had a higher level of depression symptoms than respondents with 20 years - 29 years of age. Similarly, the symptoms of anxiety were noted to be significantly higher among female respondents and respondents with age >30yrs.

General questionnaire and satisfaction from organizational processes and policies adopted, amid the COVID-19 crisis.

The general questionnaire included various questions related to the impact of COVID-19 on the physical health of laboratory staff.

Infectivity rate (Did you come positive for COVID-19 at any time?)

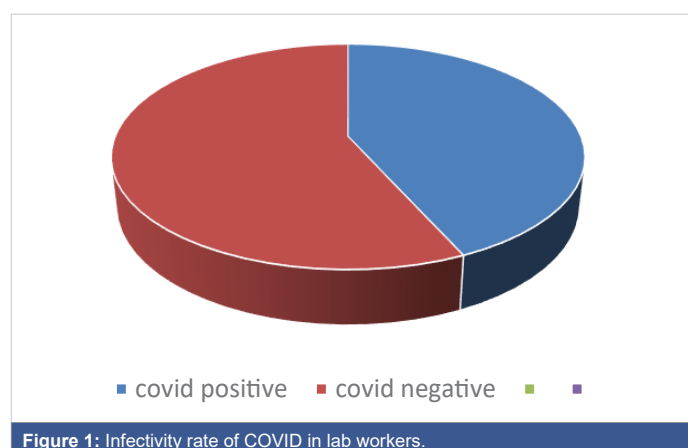
76.3% ($n = 55$) of lab workers were directly involved in COVID-19 patient services. 44.4% ($n = 32$) came positive in 1st wave of corona before the survey and 55.6% ($n = 40$) never came out to be positive as shown in Figure 1.

Working hours

Working hours were also affected by COVID-19. As working hours were increased and categorized in different ranges according to per week. 59% ($n = 42$) lab workers worked for 40 hours - 50 hours per week, 11% ($n = 8$) lab workers each were working for 20 hrs - 30 hrs, 30 hrs - 40 hrs, and more than 50 hours followed by 8% ($n = 6$) were working for less than 20 hours as shown in Figure 2.

Table 1: Demographic characteristics.

Variables	N (%age)	
Gender	Male	9 (12.5%)
	Female	63 (87.5%)
Designation	Faculty	10 (13.8%)
	Residents	17 (23.6%)
	Technicians	39 (54.2%)
	Data operators	2 (2.8%)
	Lab attendants	4 (5.6%)



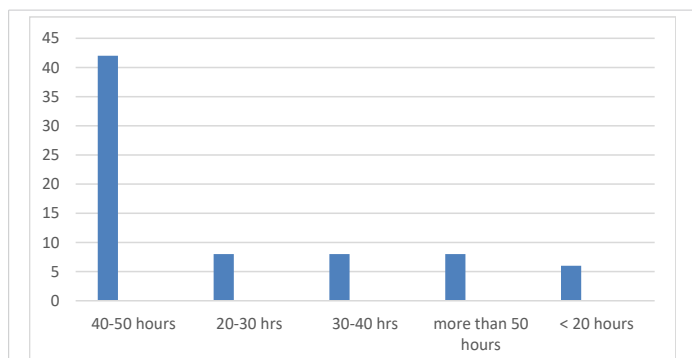


Figure 2: Working hours spent by lab workers in COVID times.

Practices in a laboratory have changed during the COVID-19 pandemic

COVID-19 changed the way of working laboratory health staff work. 49% ($n = 35$) of lab workers agreed that their way of working has been changed around 30% - 50%. Each of the 18% ($n = 13$) of lab workers accepted that lab practices have been changed to around 50% - 80% and less than 30%. According to 10% ($n = 7$) of lab staff, practices have changed more than 80% followed by 6% ($n = 4$) of staff workers who agreed that no change has been done in laboratory practices during COVID-19 as shown in Table 2.

Apprehensive about your safety

The questions inquired how participants felt at all about their safeties which were documented as follows - apprehensive, very apprehensive, extremely apprehensive, and not apprehensive. 27 (38%) were apprehensive, 22 (31%) were very apprehensive followed by 15 (21%) somewhat apprehensive, 7 (10%) extremely apprehensive and 1 (1%) was not apprehensive at all. One of the staff believed that their prior safety training and education were lacking to effectively confront this situation.

Does your hospital have a policy to test healthcare workers if accidentally exposed to COVID-19 patients at the workplace?

Eighty-seven percent ($n = 63$) of survey participants were overall satisfied with the measures adopted by the institution to tackle the crisis. But 13% ($n = 9$) of staff members felt that the hospital premises didn't have a policy for exposed health workers as shown in Table 3.

Were you provided with adequate safety equipment (gloves, aprons, caps, PPE, etc)

Around 67% ($n = 48$) lab workers felt that there was sufficient and timely provision of personal protective equipment followed by 32% ($n = 23$) lab workers who felt that more than adequate kits were provided, and 1% ($n = 1$) felt that there was no sufficient safety equipment provided by hospital administration.

Table 2: Timings in a laboratory have changed during the COVID-19 pandemic.

Duration of working hours changed	Total no. of members
<30%	18% ($n = 13$)
30% - 50%	49% ($n = 35$)
50% - 80%	18% ($n = 13$)
>80%	10% ($n = 7$)
No change	6% ($n = 4$)

Table 3: The hospital has the policy to test healthcare workers if accidentally exposed to COVID-19 patients at the workplace.

Hospital measures	Total no. of members
Satisfied with the measures	87% ($n = 63$)
Not satisfied with the measures	13% ($n = 9$)

What is the policy of post-test quarantine for healthcare workers in case of exposure at your workplace? Please specify

The responses were documented as 36% ($n = 26$) lab workers agreed that they were quarantined at home after contact with a positive patient, 31% ($n = 22$) were quarantined at home as COVID positive, 13% ($n = 9$) didn't know the status, 19% ($n = 14$) were quarantined at the hospital after contact with the positive patient and 1% ($n = 1$) was quarantined at the hospital as COVID positive.

If quarantined at home/hospital, how did you utilize your time? Check all that apply

Approximately 42% ($n = 30$) of lab workers agreed that they utilized their time on social media, 14% ($n = 10$) of lab staff read books, 7% ($n = 5$) each enjoyed the music and spent time with family, 6% ($n = 4$) utilized time doing yoga and 32% ($n = 23$) spent time by utilizing all above activities.

The psychological toll on healthcare workers

The psychological toll included two questionnaire levels, one was a coping level and the other was a general health questionnaire.

Coping level: This questionnaire is for measuring the effective and ineffective ways of coping with a stressful life event. To ensure staff's sense of meaning and engagement indicators of stress included in the survey were an inquiry regarding their coping level amidst the COVID-19 times and the impact of declining workload on their routine activities. More than half i.e. 80% of the laboratorians agreed that they feel a low level of energy and enthusiasm while coming to work, which they had before these rough times. They have been turning to work or other activities to take their minds off things. The coping level was measured as a healthy way and the unhealthy way in which the total survey questionnaire was 28 and they scored 1 - 4. The healthy way was scored 1-2 and the unhealthy way was scored 3 - 4. Seventy percent ($n = 51$) of laboratory workers fell under unhealthy way of coping and 30% ($n = 21$) of staff fell under healthy way of coping (Table 4).

**Table 4:** Percentage of members cope in different ways.

	Cope in healthy ways	Use unhealthy ways of coping
Scores (1 - 4)	1 - 2 scores	3 - 4 scores
Total members	21 (30%)	51 (70%)

Table 5: General health questionnaire level (GHQ-12).

	No psychological stress (no concern)	Psychological stress (requires concern)
Scores	Score 2 or less than 2	Score 3 or above
Total members	23 (32%)	49 (68%)

General health questionnaire level (GHQ-12): It included 12 questions that assessed the psychological strains and mental health. They ranged from 1-4 included - better than usual, same as usual, less than usual, and much less than usual. For GHQ-12 cut-off is 2/3, that is no psychological stress at 2 or below and a score of 3 or above indicates concern. For those scoring 2 or below the statement might be Wonderful, they were doing very well. Those scoring 3 and above can be asked to relax. Sixty-eight percent ($n = 49$) of laboratory workers scored 3 or above, so there was a need for concern and asked to relax while 32% ($n = 23$) workers scored 2 or below as shown in Table 5. The most frequent concern was transmitting the infection to family than to themselves only.

Discussion

As a communicable disease, and now a global Public Health Emergency (PHE), COVID-19 places a unique challenge on our health and social care workforce that will disrupt not just their usual work duties but also their social context [9]. Worldwide, COVID-19 has affected large numbers of frontline HCWs. As of March 2020, COVID-19 has infected more than 3000 HCWs in China only [10]. However, since the COVID-19 outbreak, the laboratory management system has become particularly vulnerable. The Most prominent issue is that a tremendous burden is placed on clinical laboratory resources. Generally, Because of cost containment strategies and laboratory space size, clinical laboratories have been designed and organized to sustain a customized volume of tests for a local health system, rather than concerned with rapidly expanding their testing capabilities [6,11]. Unfortunately, as COVID-19 continues to spread, the daily activity in separate clinical laboratories is rapidly saturated or even overwhelmed and disrupted by the large numbers of tests for COVID-19 [12-14]. During outbreaks, the HCWs experience considerable stress. HCW'S reported extreme somatization, depression, anxiety, and obsession-compulsion. Risk factors for mental health include overwhelming situations, social disruption of daily life, feeling vulnerable, at risk of getting infected, fear of transmitting the disease to families, and loved ones [15,16]. The majority of studies focused on the psychological impact of COVID-19 on frontline HCW's whereas none of the studies in the literature talked about the impact of COVID-19 on laboratory health workers. This review suggested how laboratory health workers' life is impacted by COVID-19 preferably in both the view including physically and mentally. Our study found that the female gender had

a significantly higher risk of psychological stress which is following the published data during epidemics where a female working in a healthcare system was more prone to develop depression and anxiety [3,17,18]. Our study shows that respondents with higher age (30 years - 50 years) have a significantly higher impact on mental health. This might be due to higher mortality risk among the elderly population and older adults are committing suicide due to a relapse of a depressive illness during the COVID-19 outbreak. These results were concordant with other studies [14,19,20]. Most of the laboratory staff workers were using social media to cope with their mental health issues followed by the use of psychological aids in the form of books. Similarly, only 4 % of respondents used psychotherapy or counseling to win the battle against psychological problems during the COVID-19 outbreak [21-23]. The study found that laboratory workers experienced anxiety about their own and their family's safety (along with their patients) but maintained the professional obligation to effectively complete their work. Like our study, many studies have been conducted that have detected the presence of depression and anxiety among HCWs [24-26]. Sun, et al. results indicated that in the early stages of the outbreak, anxiety and fear were prevalent which led to feelings of helplessness. The authors noted some healthy coping strategies, including team encouragement and rational thinking [27]. Routine management inside the separate laboratories could not cater to the demand of the COVID-19 public health emergency [28,29]. Public health emergencies impacting the laboratory medicine discipline, and the management of laboratory medicine faced many challenges [30-33]. The authors found that older staff had increased stress related to increased risk of infection, (lack of) PPE, and longer work hours which further exacerbated the existing shortage of skilled workforce [34-37]. Literature found that Battling COVID-19 on the frontline makes lab staff vulnerable to psychological distress including high levels of depression, stress, anxiety, distress, anger, fear, insomnia, and post-traumatic stress disorder [38-40]. The study found that the female gender predicted a greater risk of psychological stress including depression, anxiety, insomnia, and distress which is similar to the other studies. Coping strategies used by laboratory staff workers included adhering to strict protective measures, following isolation guidelines, and exhibiting a positive mindset [41].

Conclusion

Laboratory professionals also continue to suffer from unprecedented challenges and fears. The financial implications, the declining motivation levels, inadequate provision of PPE harnessing safety concerns, the additional stress of transport arrangement during the lockdown, and the fear of being laid off from the job amid the COVID-19 crisis are major concerns requiring immediate attention by the management, as they can potentially affect efficiency and productivity.



The findings of this survey provide us with certain lessons that hospital management has to prepare or to launch immediate psychological and physical interventions for laboratory staff members for such an unpredicted crisis in times to come.

Limitations

The results are limited as all study variables were measured through self-report from a single laboratory (Pathology) and further research is needed to address these issues using multiple sources of information for a thorough comparison.

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