


# The Impact of COVID-19 Pandemic on the Psychological Health and Dental Practice of Oral Healthcare Workers: A Scoping Review

Farooq Ahmad Chaudhary<sup>1</sup>, Ayesha Fazal<sup>1</sup>, Basaruddin Ahmad<sup>2</sup>, Osama Khattak<sup>3</sup>, Mawra Hyder<sup>1</sup>, Muhammad Mohsin Javaid<sup>1</sup>, Azhar Iqbal<sup>3</sup>, Rakhi Issrani<sup>4</sup>

<sup>1</sup>Department of Community Dentistry, School of Dentistry (SOD), Federal Medical Teaching Institution (FMTI)/PIMS, Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad, Pakistan; <sup>2</sup>School of Dental Sciences, Universiti Sains Malaysia, Kubang Kerian, Malaysia; <sup>3</sup>Department of Restorative Dentistry, College of Dentistry, Jof University, Sakaka, Saudi Arabia; <sup>4</sup>Department of Preventive Dentistry, College of Dentistry, Jof University, Sakaka, Saudi Arabia

Correspondence: Farooq Ahmad Chaudhary, Department of Community Dentistry, School of Dentistry (SOD), Federal Medical Teaching Institution (FMTI)/PIMS, Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad, Pakistan, Tel +92 3325560644, Email [chaudhary4@hotmail.com](mailto:chaudhary4@hotmail.com)

**Abstract:** This study aims to identify the impact of the COVID-19 pandemic on the psychological health and dental practice of oral health-care workers (OHCWs). The search for relevant literature was carried out online using PubMed, Web of science, and science direct databases from January 2020 to February 2021. Those articles were included that provided complete information about the impact of the COVID-19 pandemic on oral health-care workers during covid-19 and were original articles and reviews. Those articles were excluded from the current study that was not in English Language and involved case reports/book chapters/short communications. Finally, only 8 articles were selected for the scoping review considering that complete information regarding the provision of dental care in the time of COVID-19 was provided. Increased psychological distress (especially those with existing comorbidities) was noted among the OHCWs during this pandemic. They had enough knowledge about COVID-19 and showed concern regarding the future of dentistry. Either complete or partial closure of dental clinics had introduced financial constraints among them. However, the majority of them did not switch their profession. The institutions were not prepared for any such situation and no training was conducted to control the spread of COVID-19 infection. OHCWs are fully aware of the knowledge regarding COVID-19 and showed concerns for dentistry and dental health-care workers during this pandemic. Complete or partial closure of dental clinics has had adverse effects on the future of dentistry, economically as well as psychologically. Institutions need to upgrade and strengthen their systems to cater to any such situation efficiently. Proper counseling sessions should be conducted for the OHCWs to monitor, identify and treat the cases found.

**Keywords:** dental practice, oral healthcare workers, COVID-19, psychological health, comorbidities

## Introduction

In December 2019, a pneumonia outbreak that started in Wuhan, China had spread rapidly to the entire world.<sup>1-4</sup> In response, the WHO had declared it a “Corona Virus Disease (COVID-19)” pandemic on March 11, 2020.<sup>5,6</sup> The second wave of the pandemic peaked all over the world in the mid-summer of 2020 due to the relaxation of precautionary measures by the local governments.<sup>7</sup> It reached a plateau and then gradually declined as a result of social distancing, mandatory use of face masks in public areas, the use of sanitizers, and tracing, testing, and isolation of the close contacts of identified cases. Then, several new variants of concern with higher transmissible and more severe disease emerged in the UK, South Africa, USA, and Japan/Brazil and were cautioned by the CDC of the US.<sup>8,9</sup> The following third wave turned out to be more deadly but by then vaccination programs have rolled out.<sup>10</sup> The COVID-19 pandemic, which has entered the third wave in most countries by May 2021, has affected the lives of all walks of people globally.

COVID-19 can affect all levels of society. Health-care workers (HCW) have been the predominant front-line defense workforce during the pandemic; they have a greater risk of getting infected at the workplace through contact with COVID-19 positive patients who seek treatment at clinics and hospitals. The Italian National Institute of Health<sup>11</sup> reported 13,000 cases and the International Council of Nurses (ICN)<sup>12</sup> claimed that more than 90,000 cases of OHCW have been infected across the globe during the first wave when the protective equipment was scarce. OHCW also experienced burnout due to additional workload while attending the COVID-19 patients.<sup>13</sup> The pandemic also causes psychological distress among the HCW as a result of overwork, lack of rest, anxiety related to fear of getting infected and infecting others; thus, a timely assessment and proper interventions are important.<sup>14,15</sup> Although there are voluminous studies on the psychological effect on HWCs, few studies involved the oral health-care workers (OHCWs) who are equally vulnerable to the disease and under unprecedented pressure because of the nature of the profession.<sup>5</sup> The reports suggested that OHCWs experience distress and anxiety during the pandemic psychological distress the picture is less than clear. This review was aimed to determine the understanding about the potential factors influencing psychological distress of OHCW during the pandemic.

Oral health-care workers (OHCW) are equally vulnerable to the disease and under unprecedented pressure because of the nature of the profession.<sup>5</sup> Dentists have been reported to be in a state of fear and suffered from psychological distress while at work during the pandemic.<sup>16</sup> Dentists in the UK, USA, and Ireland are reported to close their practices temporarily or permanently and suffer large financial losses due to suspension of care.<sup>17,18</sup> The recommendation to limit services to emergency procedures only has increased the anxiety and insecurity levels and financial issues among oral health practitioners. It has been suggested that mental instability among the HCWs, including OHCWs, might precipitate Post Traumatic Stress Disorder, anxiety, and depression.<sup>19–22</sup> There is currently a dearth of review on the psychological impact of the COVID-19 pandemic on OHCWs. Therefore, this scoping review aimed to describe the psychological health of oral health-care workers during the COVID-19 pandemic and identify the interventions and strategies that can improve the mental health status of OHCWs.

The participants, context, and concept mentioned in the study are explained below:

## Study Participants

OHCW includes dental surgeons, dental assistants, dental technicians, individual professionals, representatives of professional bodies and dental academics (lecturers/Assistant professors/Professors, etc).

## Concept

This review considered only the psychological health of OHCWs related to COVID-19 pandemic and the interventions are training and counselling sessions for those who have been psychologically affected by the pandemic.

Outcomes related to dental practices of OHCWs and the adverse effects of this pandemic on their practices will be identified.

## Context

The setting is the work premises of the OHCW which included dental hospitals and clinics and teaching dental hospitals and dental colleges.

## Materials and Methods

### Identification of Relevant Studies: Search Strategy

The search for articles was carried out in the PubMed, Web of Science and Science Direct databases and gray literature in Google scholar but limited to original research reports in English Language published between January 2020 and February 2021. The keywords and terms used in the online search were derived by two primary investigators (A. F. and F.A.C.) and had been reviewed by other co-authors and included oral health-care workers, COVID-19, pandemic, dentistry, and dental practice. Reports in other languages, case reports, book chapters and short communications were excluded.

All records were merged into a single file and duplicate reports were removed. The titles and abstracts of the records were then screened to identify the relevant reports by two investigators (A. F. and F. A. C.). In case of disagreement, the record was referred to the third investigator (M.H.) to arrive at a decision. Then, the full text of only the relevant studies were retrieved and screened based on eligibility criteria by the same two investigators. Pre-screening was done by recording the results from different search bases.

## Data Abstraction and Synthesis: Charting Data

Data extracted from reviewed OHCWs centred care framework and model were included in data extraction records and synthesized in summary format. Data extraction was carried out using a charting form in Microsoft Excel and had included the information on authorship, article type, year, population, and OHCW-centered care approach. The charted data was used to identify themes relating to psychological status, and potential causes of psychological distress in OHCWs.

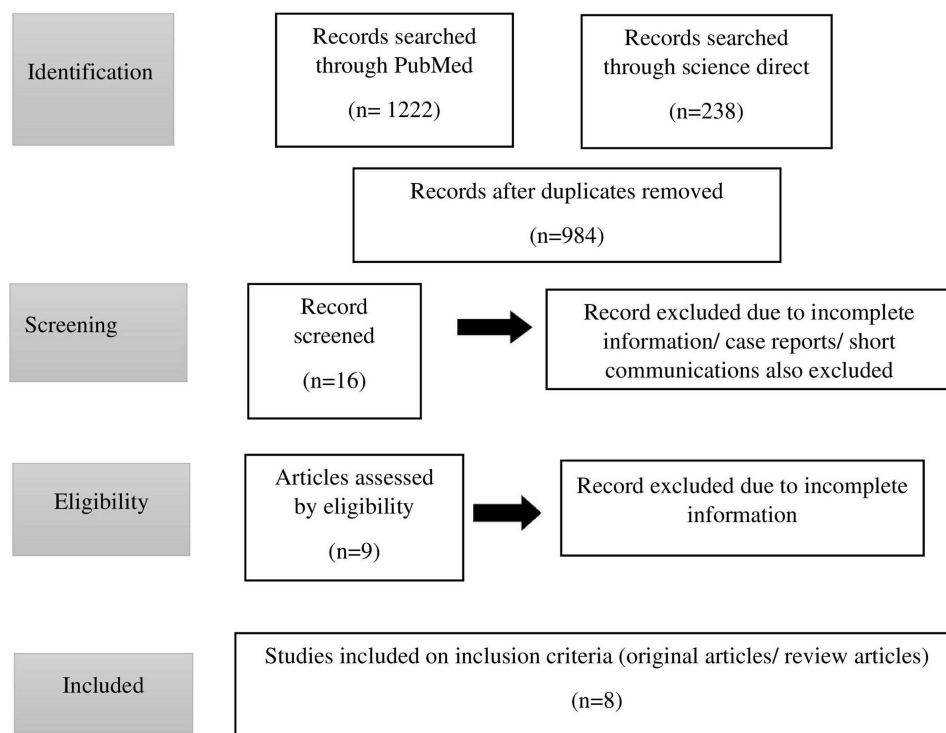
## Results

The search process to identify the relevant articles is presented in the Flow Diagram in [Figure 1](#). Only 16 full-text reports were retrieved, seven studies were excluded due to incomplete information ( $n = 965$ ), and short communication ( $n = 3$ ). The remaining nine studies were screened based on eligibility criteria, and after which only eight studies were found to be relevant to the current study.

This study had identified five themes in research on OHCW during the pandemic: psychological impacts, preparedness, concerns, epidemiological factors, and future of practice.

## Theme 1: Psychological Impacts

Three studies had assessed the psychological impact of the pandemic on OHCW. One study reported that 11.5% of dentists experienced anxiety, based on assessment using Kessler's K6. In the same study, lower psychological distress



**Figure 1** PRISMA 2009 flow diagram showing study characteristics.

was found to be in relation with being in a committed relationship ( $p = 0.021$ ) and having higher self-efficacy ( $p = 0.005$ ).

## Potential Causes of Psychological Distress in OHCWs

Three main sub-themes identified were: financial, concern of infection, work (sub: workload, intervention/training).

### Financial

Four studies had linked the impact of the pandemic to financial issues, since the dentists are unable to practice, which affected their financial status.

### Concerns Regarding Spread of Infection

Dentists being a high-risk population among the front-line workers showed greater concerns regarding the current pandemic. However, fear of being in contact with COVID-19 infected people was found to be more among those people with some chronic illnesses, psychological distress, or those with the greater workload, since existing comorbidities make them a better candidate to get the disease.<sup>23,24</sup>

### Increased Workload

Increased workload had been a reason to worry for the dentists during this pandemic. Lack of training and equipment created an unsettled state among the dentists. One study reported that only 12.6% dental staff was being trained for this pandemic.<sup>23</sup>

## Theme 2: Preparedness

The preparedness of dentists can be explained in two sub-themes: knowledge about COVID-19 among dentists, and guidelines.

### Knowledge About COVID-19 Among Dentists

Arora et al explained that the majority of dentists had enough knowledge about COVID-19 and were worried about the adverse effects caused by this pandemic.

The feedback was received from 26 countries. The overall response rate from United States and Indonesia was 14.3%. The rate of response being higher in Indonesia. 92% of the dentists were aware about the transmission of COVID-19. Nearly all the participants recognized breathing problems as an alarming sign of COVID-19. A few dentists had a limited knowledge about breathing issues being an alarming symptom. 91% of the subjects knew that there is no vaccine for COVID-19. The knowledge about the diagnosis of COVID-19 was higher among the respondents, while it was significantly low about the transmission, symptom, treatment and protection methods. The level of knowledge was low among the undergrads as compared to specialists and PHD holders. Clinicians who saw more number of patients had higher scores. Countries that were affected the most and had highest number of COVID-19 cases had more knowledge.<sup>25</sup>

### Guidelines

Dentists were recommended to follow CDC and WHO guidelines during this pandemic.<sup>26</sup>

## Theme 3: Concerns and Worries

Four studies included that dentist were concerned about this alarming situation of pandemic, adversely affecting the dental practice. Chaudhary et al stated that although dentists were concerned about the current situation, they responded that their institutions were not well prepared to cater to this pandemic situation.<sup>27</sup> The academics were found to be worrisome about the professional responsibilities and restricted mobility. There was direct dose-dependent association found between the worries and fear of the dental academics and the spread of pandemic. Greater fear and worries were found to be associated with frequent hand washing among the participants during this pandemic.

## Response to the Concerns

Only 12.6% of the population responded that infection control sessions have been conducted in their institutions. Overall, the dental community was concerned regarding the future of dentistry.<sup>28,29</sup>

## Theme 4: Epidemiological Aspects

The epidemiological aspects include epidemiology, and epidemiological investigations.

### Epidemiology

89.6% of dentists showed concerns about the future of dentistry. This increased number is thus an alarming situation for the dentists.

### Epidemiological Investigations

Meng et al summed up that provision of emergency dental procedures along with using advanced PPE is found to prevent the spread of COVID-19 infection. Although maintaining a balance between the provision of dental care and COVID-19 infection control is required.<sup>30</sup>

## Theme 5: Future of Practice

### Use of SOPs

Ugo et al expressed that during the current pandemic, either complete closure of dental clinics or only restricted dental practice was observed following standard operating procedures (SOPs) strictly. The dental practice has been compromised severely due to this pandemic.

### Guidelines Follow- Up

Albeit guidelines for dental practice during the pandemic have been regulated throughout the world, and financial constraints had been observed among dentists from various regions of the world. These include America, China, Saudi Arabia, the United Kingdom, and Spain. It has been concluded that governments should address ways to overcome this issue by making changes in the policies.<sup>18</sup> Another study explained that during this pandemic, guidelines issued by CDC and WHO need to be followed.<sup>26</sup>

Themes and sub-themes formed by concluding this scoping review are given in [Table 1](#). The summary of the included studies is mentioned in [Table 2](#).

**Table 1** Themes and Sub- Themes

S. No.	Themes	Sub-Themes
1.	Psychological impacts	Financial Concerns regarding spread of infection Increased workload
2.	Preparedness	Knowledge about COVID-19 among dentists Guidelines
3.	Concerns and worries	Concerns of OHCWs Response to the concerns Worries of professional responsibilities and restricted mobility
4.	Epidemiological aspects	Epidemiology Epidemiological investigations
5.	Future of practice	Use of SOPs Guidelines follow- up

**Table 2** Summary of Studies Included in the Scoping Review

S. No.	Title	Study Type	Outcome of Paper	Limitations	Author, Year, Country
1	Covid-19 Factors and Psychological Factors Associated with Elevated Psychological Distress among Dentists and Dental Hygienists in Israel	Original Article	<ul style="list-style-type: none"> <li>• 11.5% of distress assessed using "Demands scale"</li> <li>• Fear of being in contact with covid-19 patients</li> <li>• Those subjects fear of being in contact with covid-19 patients, those who had a chronic illness and those with a higher workload, and those who higher psychological distress associated with covid-19</li> </ul>	Long-term and short-term psychological effects need to be addressed	Shacham et al 2020, Israel <sup>23</sup>
2	Epidemiological Aspects and Psychological Reactions to covid-19 of Dental Practitioners in the Northern Italy Districts of Modena and Reggio Emilia	Original Article	<ul style="list-style-type: none"> <li>• Either complete dental practice closure or severe restriction in the activity was observed by all the subjects</li> <li>• 89.6% of dentists showed concerns about the future of dentistry</li> </ul>	Future implications need to be mentioned and implementation to be done	Consolo et al 2020, Italy <sup>28</sup>
3	Evaluation of Knowledge and Preparedness Among Indian Dentists During the Current COVID-19 Pandemic: A Cross-Sectional Study	Original Article	<ul style="list-style-type: none"> <li>• The majority of the dentists had enough knowledge regarding COVID-19</li> <li>• Half of the dental population showed concern regarding the danger due to pandemic</li> <li>• 41.8% were willing to carry out emergency procedures only</li> <li>• Dentists were advised to follow CDC and WHO guidelines in their clinics to cater to this pandemic</li> </ul>	Data collection is limited to online accessibility and shorter duration Respondents from limited areas included, so results cannot be generalized	Arora et al 2020, India <sup>26</sup>
4	Concerns, perceived impact, and preparedness of oral healthcare workers in their working environment during the COVID-19 pandemic	Original Article	<ul style="list-style-type: none"> <li>• The majority of OHCWs showed concerns regarding the COVID-19 pandemic</li> <li>• Less than 50% of the dental population responded that their institutions are well prepared to cater to the situation</li> <li>• Only 12.6% population had attended the infection control training sessions</li> <li>• Participants were self-practising the precautionary measures to overcome this situation</li> </ul>	Implementation of interventions need to be addressed	Chaudhary et al 2020, Pakistan <sup>27</sup>

(Continued)

Table 2 (Continued).

S. No.	Title	Study Type	Outcome of Paper	Limitations	Author, Year, Country
5	Current Clinical Dental Practice Guidelines and the Financial Impact of COVID-19 on Dental Care Providers	Review Article	<ul style="list-style-type: none"> <li>• Limited clinical practice during the pandemic helped in curtailing the spread of COVID-19</li> <li>• Dentists had to face serious financial constraints because of the limited practice</li> </ul>	Confounding factors may exist ie, psychological, social factors need to be considered	Ali et al 2020, Saudi Arabia <sup>58</sup>
6	Epidemiological Investigation of OHCWs with COVID-19	Original Article	<ul style="list-style-type: none"> <li>• The use of advanced PPE decreased the chances of getting infected with COVID-19 in comparison to routine PPE</li> <li>• Practicing emergency procedures only was recommended</li> <li>• A balance between the provision of dental services and COVID-19 infection control should be introduced</li> </ul>	Recommendations should have been given regarding maintaining a balance between the provision of dental services and COVID-19 infection control	Meng et al 2020, China <sup>30</sup>
7	Knowledge of dental academics about the COVID-19 pandemic: A multi-country online survey	Original Article	<ul style="list-style-type: none"> <li>• The response rate was highest in Indonesia</li> <li>• 92% of the dentists were aware about the transmission of COVID-19</li> <li>• 91% of the subjects knew that there is no vaccine for COVID-19. The knowledge about the diagnosis of COVID-19</li> <li>• Clinicians who saw more number of patients had higher scores. Countries that were affected the most and had highest number of COVID-19 cases had more knowledge.</li> </ul>	Large amount of data through online survey might have led to difficulty in true reporting, which might lead to reporting bias	Ammar et al 2020, Egypt <sup>25</sup>
8	Behavior change due to COVID-19 among dental academics—The theory of planned behavior: Stresses, worries, training, and pandemic severity	Original Article	<ul style="list-style-type: none"> <li>• Academics were found to be worrisome about the professional responsibilities and restricted mobility</li> <li>• Direct dose dependent association found between the worries and fear of the dental academics and the spread of pandemic</li> <li>• Greater fear and worries were found to be associated with frequent hand washing among the participants</li> </ul>	Large amount of data through online survey might have led to difficulty in true reporting, which might lead to reporting bias	Ammar et al 2020, Egypt <sup>29</sup>

## Discussion

In this study, we reviewed the impact of COVID-19 on the dental practice of oral health-care workers (OHCWs), and how it has affected their psychological health. The majority of OHCWs showed greater concern regarding the risk of being infected, as they are most exposed to the infection. Similar findings were found in a study conducted in Singapore during the SARS outbreak.<sup>31</sup> Same results were also found while considering long-term psychological and occupational effects on HCWs those provided hospital health care during the SARS outbreak in Toronto, Canada during SARS outbreak.<sup>32</sup>

In this study, Arora et al<sup>26</sup> concluded that about 80.8% of the participants had fair knowledge (40–70%) about the disease. In contrast to this, Kamate et al showed a higher percentage of respondents (92.7%) with fair knowledge among females and post-graduate residents. This difference of knowledge might have appeared due to the choice of areas where the studies have been conducted; since the former study is of developing country India, and the latter is of developed countries like America and Australia.<sup>33</sup> This study varied from the other one conducted by Putrino et al in which males dentist were found to be more aware of this disease than females.<sup>34</sup> However, it showed similar results to the study conducted by Quadri et al in which specialists showed higher levels of knowledge than the graduates.<sup>35</sup> In the current study, OHCWs did not suggest quarantine in the absence of symptoms, which is contrary to the study of the SARS outbreak in 2002 where people were asked to quarantine even if they were asymptomatic.<sup>36</sup>

Overall, the dental community was found to be endangered to practice in the current situation, which might be an influence of vast media coverage, lack of technical equipment and shortage of personal protective equipment (PPE), extended working hours, and many other reasons.<sup>37,38</sup> Moreover, in this study, it was concluded that dental staff exhibited greater psychological stress problems amid this pandemic because of greater exposure to risk. This finding is relevant to the study that showed unwillingness by dentists to treat patients diagnosed with some infectious diseases like HIV<sup>39,40</sup> and tuberculosis.<sup>41</sup>

Regarding self-efficacy, higher self-efficacy reflects lower psychological distress levels. Self-efficacy plays the most important role since improved self-efficacy levels can enhance personal performance in different tasks and other related behaviours.<sup>42</sup> While considering the stress levels with dental staff with some other comorbidities, they were found to exhibit greater psychological distress possibly because they were going through the distress caused by already existing comorbidities.<sup>43</sup> Albeit dentists showed concerns regarding the future of dentistry, only a few among the dental population looked to change their profession and the majority continued with dental practice amid this pandemic. This finding was found to be consistent with the findings of other studies carried out in Singapore and the USA during the SARS and influenza outbreak, where HCWs continued to practice their profession.<sup>31,44</sup> However, in contrast to these findings, HCWs were unwilling to work during infection outbreaks in Taiwan, Hong Kong, and the UK. They preferred other jobs over working in health-care settings.<sup>45–47</sup>

This pandemic had severe adverse effects on dental practice. Partial to complete closure of the dental clinics/hospitals has been implemented due to the COVID-19 pandemic, which has led to major economic setbacks to the dentists.<sup>48</sup> Only a small proportion (12.6%) of OHCWs had attended sessions in their institutions, which in comparison to the study in Singapore is much lower (88%) during the SARS outbreak. This is the need of the hour that OHCWs should get proper training sessions to cater to this current pandemic situation.<sup>29,49</sup> This pandemic has been a major setback for dental students too. Dental education has been affected adversely during this time since dental practice plays a major role in learning dentistry, which cannot be achieved by online learning.<sup>50</sup>

Focus on the provision of preventive dental care with minimal aerosol production procedures is required to be practised. Check on patients who have had dental treatment from the dental clinics should be kept under observation to check if they get the infection due to treatment. Advanced teledentistry should be made practical during this pandemic.<sup>51–54</sup> Many countries including Pakistan have recommended guidelines for dental practice during COVID-19 which needs to be implemented on the ground to stop the spread of this pandemic. This study highlights the importance of precautionary measures required to be taken by the OHCWs amid COVID-19 since the world has hit the third wave of this infectious disease. Focusing on the mental health of OHCWs in the current situation is the need of the hour. This would be beneficial to cope with the future challenges faced during implications regarding training

sessions on infection control for the dentists and dental staff.<sup>55–57</sup> The limitations of this study were, since this is a new virus, more research is required to be done to see its impact and due to limited access to the search engines, a restricted number of studies could be accessed.

## Conclusion

Overall, this study shed light on the psychological effects on OHCWs amid the COVID-19 pandemic, and how this pandemic has affected their lives. Our results show that OHCWs are fully aware with knowledge regarding COVID-19 and showed concerns for dentistry and dental health-care workers during this pandemic. Complete or partial closure of dental clinics has had adverse effects on the future of dentistry, economically as well as psychologically. Institutions need to upgrade their strengthening systems to cater to any such situation efficiently. Focus from diagnosis and treatment needs to be shifted towards preventive oral care to reduce the burden of outpatient departments. All the oral health-care workers/providers should be readily vaccinated following all the standard operating procedures to minimize the chance of cross-infection. Along with these, proper counselling sessions should be conducted for the OHCWs to monitor, identify and treat the cases found. However, policy and decision-makers need to make policy in this regard followed by its implementation.

## Disclosure

The authors report no conflicts of interest in this work.

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