

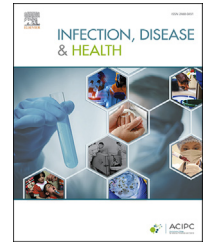


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Research paper

A cross-sectional survey of dentists' knowledge, preparedness, and experiences of managing COVID-19 in Australia

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Abstract *Background:* COVID-19 is a global health crisis. Close contact with the mucous membranes and respiratory secretions of patients and aerosol-generating procedures renders dentists and other oral health professionals at high risk of exposure to SARS-CoV-2. We examined dentists' knowledge, preparedness, and experiences of managing COVID-19 in Australia. *Methods:* A cross-sectional online survey of dentists with a current membership with The Australian Dental Association (ADA) was conducted between March and April 2021. *Results:* Of the 368 survey responses, most dentists (72.3%) reported having a good level of knowledge about COVID-19, with most visiting the ADA Federal COVID-19 (74.7%) and state/territory department of health websites (62.8%), respectively to source up-to-date information. Most dentists (87.6%) felt prepared to manage COVID-19 into the future, although 66% reported not receiving training or certification in the use of PPE. Over half (58.7%) reported not

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being concerned about contracting SARS-CoV-2 at work, with some (28.9%, n = 98/339) feeling more stressed than usual and having heavier workloads.

Conclusion: COVID-19 had significant impact in oral healthcare in Australia. Dentistry has adapted to the varied challenges raised by the pandemic. Comprehensive training and detailed guidelines were fundamental for successful patient management during the COVID-19 outbreak.

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Highly

- COVID-19 had significant impact in oral healthcare in Australia.
 - Australian dentistry quickly adapted to the varied challenges raised by the pandemic.
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downloaded from REDcap™, cleaned in Microsoft Excel, and analysed in IBM SPSS 26®. Questions with no response were treated as missing values and the respective denominators were adjusted accordingly. Descriptive statistics were used to analyse the data.

Re

Of the 368 responses, all but one dentist (99.7%) reported residing in Australia, with the majority currently working in the states of New South Wales, Victoria and Queensland. Respondents reported an average of 25.10 (SD 12.91) years in Queensland.

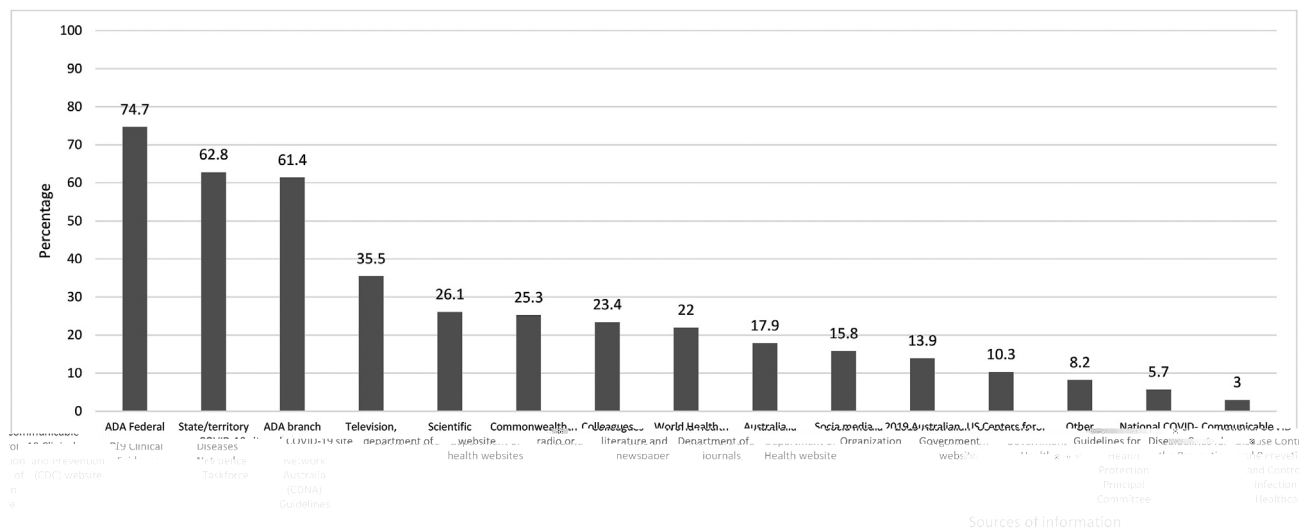


Fig 1 Sources of up-to-date COVID-19 information used by respondents.

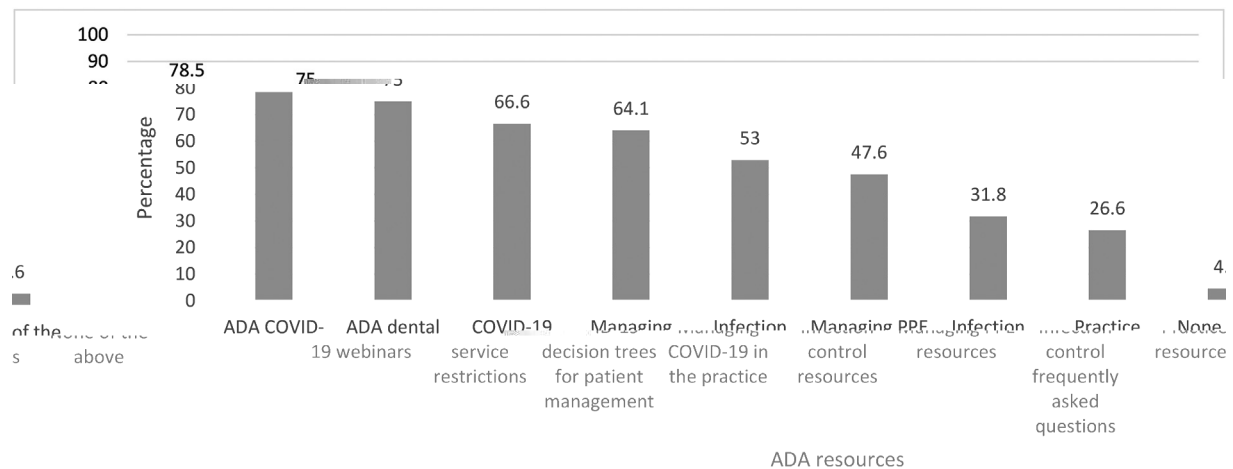


Fig 2 COVID-19 resources available within the ADA website used by respondents.

in using PPE for managing COVID-19 patients, 68% ($n = 242/356$) reported they were 'mostly' or 'entirely' confident (see Table 2).

Discussion

Most dentists (75.8%, $n = 257/339$) reported that their practice/service was not involved in assessing or treating suspected or confirmed cases of COVID-19 (93.2%, $n = 316/339$). Just over half the dentists (55.5%, $n = 188/339$) referred relevant cases to other facilities. In terms of their participation in COVID-19 outbreak response activities, half of the respondents (51.9%, $n = 191/368$) reviewed and updated policies or procedures, almost a quarter were involved in supporting healthcare staff (23.9%, $n = 88/368$) as well as other staff (26.4%, $n = 97/368$), as summarised in Table 3.

At the time of the survey, most respondents (58.7%, $n = 199/339$) indicated feeling 'not at all' or 'slightly

concerned' about contracting SARS-CoV-2 at work, with a few (5.9%, $n = 20/339$) feeling 'extremely concerned'. A majority (82%, $n = 278/339$) reported no absence from work due to these concerns, while 32.2% had taken an absence from work while waiting for SARS-CoV-2 testing results (109/339). Few respondents (14.2%, $n = 48/339$) avoided telling others about their involvement caring for COVID-19 patients out of fear of negative reactions. Likewise, 10% of respondents felt their family or friends had avoided contact with them due to the nature of their work ($n = 34/339$) and had experienced or witnessed racial or other forms of discrimination at work associated with the outbreak (10.3%, $n = 35/339$).

Some dentists (28.9%, $n = 98/339$) reported feeling 'moderately' or 'extremely' more stressed than usual at work due to the COVID-19 outbreak, while 20.6% ($n = 70/339$) were not stressed at all. Over half (51.9%, $n = 176/339$) reported that COVID-19 had somewhat increased their workload, whereas for 15.9% ($n = 54/339$) workload

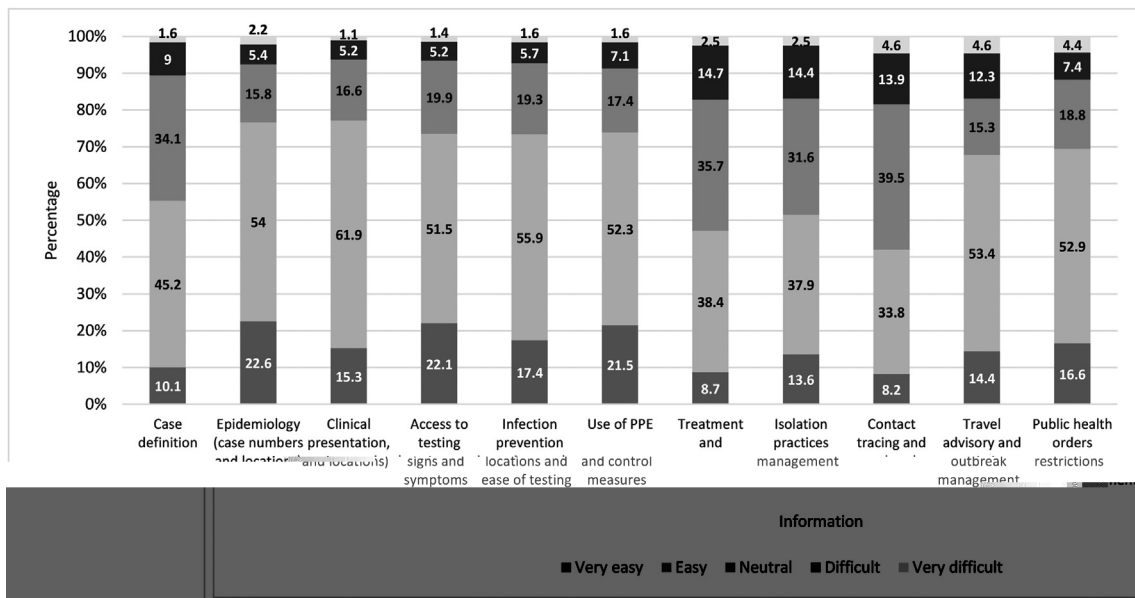


Fig e 3 Dentists' opinion about how easy or difficult it is to keep up-to-date with 11 key themes of information about COVID-19.

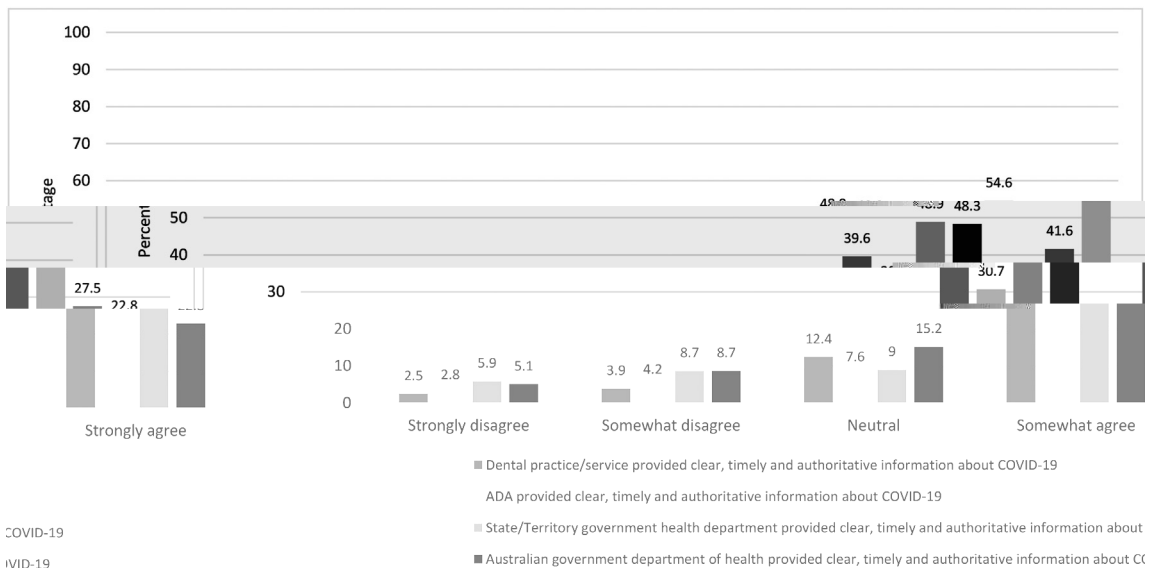


Fig e 4 Dentists' opinion about the provision of clear, timely and authoritative information about COVID-19.

had remained the same or it had lessened (11.8% (n = 40/339)).

Over half of respondents (58.4%, n = 198/339) indicated their workplace did not provide staff debriefing or psychological support services regarding COVID-19. Very few (9.4%, n = 32/339) confirmed both services being available at their workplace. The majority reported never having attended debriefings (69.6%, n = 236/339), while almost all respondents never accessed psychological support services (96.8%, n = 328/339). Among those attending the debriefings and psychological support services, 28.9% (n = 98/339) and 3.3% (n = 11/339) rated them 'useful' to some extent, respectively, as details in Table 4.

Discussion

This study examined dentists' knowledge, preparedness, and experiences managing COVID-19 in the Australian setting. COVID-19 has challenged health systems and healthcare workers across the world at various levels [4], and the results of this study indicate the same can be said of Australian dentists. Routine dental practice requires close contact with the mucous membranes and respiratory secretions of patients and aerosol-generating procedures, which renders dentists and other oral health professionals at high risk of exposure to SARS-CoV-2 [30,31].

For the dentists in this study, timely access to detailed guidelines was critical to the safe management of patients.

Tab e 2 Adequacy of PPE training and respondents' level of confidence in using PPE for managing COVID-19.

	Dentists (N = 121)	
	n	%
<i>Adequacy of PPE training</i>		
Not at all adequate	0	0
Slightly adequate	9	7.4
Somewhat adequate	19	15.7
Mostly adequate	57	47.1
Entirely adequate	36	29.8
<i>Confidence in using PPE</i>		
Not at all confident	13	3.7
Slightly confident	31	8.7
Somewhat confident	70	19.7
Mostly confident	153	43
Entirely confident	89	25

Tab e 3 Respondents' participation in COVID-19 outbreak response activities.

COVID-19 outbreak response activities	Yes n (%)	No n (%)
Reviewing and updating policies or procedures	191 (51.9)	177 (48.1)
Establishing fever clinics	3 (0.8)	365 (99.2)
Training in donning and doffing PPE	78 (21.2)	290 (78.8)
Supporting healthcare staff	88 (23.9)	280 (76.1)
Supporting other staff	97 (26.4)	271 (73.6)
Planning for surge capacity	15 (4.1)	353 (95.9)
None of the above	118 (32.1)	250 (67.9)

At the international level, and since early stages of the pandemic, dental associations published advice for dental services and settings on pandemic response, including cancellation of elective dental treatment and other non-urgent care procedures [32]. In Australia, the ADA published a COVID-19 management framework [33] during dental service restrictions in late March 2020, with guidance about treatment and triage, and infection prevention and control measures, including PPE stock. These resources have been continuously updated [34], with the addition of dental practice policies and guidelines as well as resources for financial and mental health support. Despite the extensive list of resources, we note with interest that almost half of the respondents in our study indicated that it was 'difficult to very difficult' to keep up to date with specific information about isolation practices. Nevertheless, the early and proactive approach taken by the ADA to publish a list of COVID-19 related resources may explain why most dentists in our study visited the ADA website to obtain COVID-19 information.

Our study was carried out in March–April 2021, and the early provision of resources and guidance by the ADA could explain why most respondents had 'good to very good' knowledge of COVID-19. This finding is consistent with international studies [9,15,35–38], where it has been

Tab e 4 COVID-19 support services provided by respondents' workplace and respondents' attendance and access.

Support services provided by the dental practice/facility	n (%)
Yes, debriefing only	54 (15.9)
Yes, staff psychological support only	13 (3.8)
Yes, both	32 (9.4)
Neither	198 (58.4)
Do not know	42 (12.4)
Total	339 (100)
<i>Attending debriefings and their usefulness</i>	
No	236 (69.6)
Yes, but it was not useful	5 (1.5)
Yes, and it was slightly useful	36 (10.6)
Yes, and it was moderately useful	41 (12.1)
Yes, and it was extremely useful	21 (6.2)
Total	339 (100)
<i>Accessing psychological services and their usefulness</i>	
No	328 (96.8)
Yes, but it was not useful	0 (0)
Yes, and it was slightly useful	2 (0.6)
Yes, and it was moderately useful	4 (1.2)
Yes, and it was extremely useful	5 (1.5)
Total	339 (100)

reported that dentists have a good command of COVID-19 knowledge. Only one study from Pakistan has reported insufficient knowledge among dentists, particularly regarding fundamental COVID-19 disinfection protocols, despite available guidelines [39]. In Australia, as per the *ADA Guidelines for Infection Control* [40], all registered dental practitioners are required to implement mandatory infection control guidelines in their practices. The guidelines state that standard precautions, including hand hygiene and use of PPE, are required for routine patient care. Furthermore, they indicate that transmission-based precautions (i.e. airborne, droplet, or contact) are to be implemented for patients with confirmed or suspected infectious diseases such as blood-borne viruses, prion diseases, influenza, measles, tuberculosis and multi-resistant *Staphylococcus aureus*. The guidelines also provide strategies to separate clean and contaminated zones to prevent transmission. Hence, it is interesting that the majority of respondents in our study did not feel prepared to manage COVID-19 at their practices at the beginning of the outbreak. This could be attributed to several factors including, the lack of COVID-19-specific guidelines, the sudden onset of the COVID-19 pandemic, and the immediate implementation of Level 3 restrictions in Australia [41,42].

The combination of these factors may have left dentists feeling overwhelmed and as such, underprepared to manage COVID-19. To strengthen preparedness of their dental practitioners, the ADA published a 'Risk Management Plan' [43] in August 2020, where they emphasised the importance of infection prevention and control training for all staff in public and private dental practices, with

detailed information on transmission-based precautions including videos on PPE donning and doffing sequences. Despite this, two thirds of our respondents reported not receiving any training on the use of PPE for managing COVID-19.

In terms of levels of concern about contracting SARS-CoV-2 at work, over half of the respondents in this study reported being 'not at all concerned or 'slightly concerned'. This could be related to the overall low numbers of COVID-19 and minimal community transmission in Australia [44]. Furthermore, this may also be influenced by how knowledgeable and prepared dentists felt. Almas et al. reported that dentists who had attended a COVID-19 workshop felt more comfortable in treating patients [45]. This also applies to other healthcare professionals. Nurses with a better command of COVID-19 knowledge were more willing to care for COVID-19 patients [46,47]. Likewise, knowledge and preparedness can also be linked to confidence in patient care and implementation of good and adequate infection prevention and control practices. A Japanese study found that cardiovascular healthcare workers did not feel confident towards COVID-19 care, which was linked to insufficient knowledge about infection prevention and control measures, including PPE usage and how to isolate COVID-19 patients [48]. Abou-Abbas et al., reported that physicians who had good knowledge of COVID-19 were also likely to adopt good infection prevention and control practices [49]. It is essential that dentists and other healthcare professionals continue to receive easily accessible COVID-19-related education and training to support their confidence and willingness to care for COVID-19 patients.

The COVID-19 pandemic has exhausted global healthcare systems, and the results of this study indicate that Australian dentists are no exception [50]. Psychological factors including fear, concern and anxiety have been previously linked to pandemics, especially in settings where there are increased rates of infection and mortality [51]. Almost 30% of our respondents stated that they felt 'moderately to extremely stressed' at work. In terms of stress, the repercussions associated with the rapid spread of COVID-19 have resulted in a considerable psychological burden and fear among dentists which have been reported across different nations [50–54]. Additionally, financial hardships associated with concerns about losing their job or loss of earning in the practice as well as unexpected investments in infection control procedures have been reported as triggers of financial stress [55,56]. Jungo et al., reported that dentists in France were more concerned about the financial viability of their practice than they were about being infected with the virus [57]. Despite reporting being stressed at work, over half of the respondents indicated that they did not have debriefing or psychological support services at their workplace. This may be due to the fact that the majority of dental practitioners in Australia work in private practices, with only 5.2% of dentists working in public clinics in Australia in 2019 [58]. Although, these private practices may not have sufficient resources to support the delivery of mental health services, a national 24/7 telephone service [59] run by the Dental Board of Australia is available to support Australian dental practitioners.

Most dentists reported an increase in their workload. A recent Australian study [60] found that the total number of

paediatric dental services significantly dropped during March–June 2020, when compared to the same time period in 2019, with the largest drop occurring in April 2020, which saw a reduction of 86.9% of services being provided. The reported increase in workload by our respondents, despite the apparent reduction in overall dental services, is an interesting finding which may be explained by the sudden need of implementing additional infection prevention and control precautions in their dental practices.

This study has some limitations. The voluntary nature of the survey as well as accumulated survey-fatigue may have impacted the low number of responses. Additionally, the self-reporting nature of the survey may have generated a level of bias in the responses obtained. This cross-sectional study took place almost a year after the start of the pandemic in Australia, it was not designed to capture the full dentists' experiences during the different phases of the pandemic. Due to the lower levels of infection and deaths associated with COVID-19 in Australia, compared to other countries, there may be limitation in terms of the generalisability of our findings.

Conclusion

COVID-19 had significant impact in oral healthcare in Australia. Dentistry has adapted to the varied challenges raised by the pandemic. Our results provide clear insight into what Australian dentists experienced during the COVID-19 pandemic and will be of use in future emerging outbreak management.

Ethics

Ethics approval was granted for this study by the University of Sydney's Human Research Ethics Committee (HREC number 2020/200).

Author contributions

CSC: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Project administration, Manuscript submission. CL: Conceptualization, Methodology, Validation, Formal analysis, Data curation, Writing – review & editing. KKF: Formal analysis, Data curation, Writing – review & editing. SN: Conceptualization, Methodology, Validation, Data curation. LW: Methodology, Writing – review & editing. SL: Methodology, Writing – review & editing. AH: Methodology, Writing – review & editing. EI: Methodology, Writing and Editing. RSZ: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing. All authors contributed to the drafting of this manuscript and approved it for submission.

Conflicts of interest

[RZS - Anonymised] is an [Anonymised] of [Anonymised] but was blinded to this submission in the journal's editorial management system and had no role in the peer review or

editorial decision-making whatsoever. There are no other conflicts of interest to declare.

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Peer review

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Additional information

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.idh.2021.10.001>.

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