

The Impact of COVID-19 on Dental Anesthesiologists: An Online Survey of Board-Certified Dental Anesthesiology Specialists of the Japanese Dental Society of Anesthesiology

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Objective: The impact of the COVID-19 pandemic on dental anesthesiologists has not been examined. This study aimed to determine how the COVID-19 pandemic affected Japanese dental anesthesiologists' professional lives.

Methods: An online questionnaire related to the effects of COVID-19 on dental anesthesiologists' professional lives was emailed to 351 board-certified dental anesthesiology specialists from the Japanese Dental Society of Anesthesiology. The endpoints of this study were changes in income and job satisfaction as a dental anesthesiologist from 2019 prior to the COVID-19 pandemic.

Results: A total of 141 dental anesthesiologists participated in the survey. Most respondents reported no change in income relative to 2019 for 2020 or 2021. Significantly more dental anesthesiologists reported income decreases relative to 2019 for 2020 (39%) vs 2021 (21.3%; $P = .001$). Very few dental anesthesiologists reported income increases relative to 2019 for 2020 (2.1%) vs 2021 (15.6%; $P < .001$). Job satisfaction as a dental anesthesiologist remained unchanged for all 3 years.

Conclusion: Even though many Japanese dental anesthesiologist specialists lost income because of COVID-19, they maintained their job satisfaction.

Key Words: COVID-19; Dental anesthesiologist; Income; Job satisfaction.

Since the global outbreak in 2020 of the novel virus SARS-CoV-2 that triggered the COVID-19 pandemic, health care workers have continued performing their clinical duties to fulfill their work responsibilities while being exposed to infection risks. Dental procedures are considered a high risk for infection because many generate aerosols. The administration of sedation and general anesthesia may result in high levels of respiratory aerosols being

generated, especially when positive pressure ventilation is used during intubation and extubation, potentially exposing the clinician to high viral loads. During sedation, dental irrigation fluids can be easily aspirated, which often results in coughing that can further spread aerosolized droplets throughout a dental office. Therefore, dental anesthesiologists responsible for sedation and general anesthesia for dental and oral surgery procedures may be at a higher risk of infection.

Several recent reports have shown that the COVID-19 pandemic has affected both the personal and professional lives of health care workers. In a survey of US pediatric anesthesiologists, Margolis et al¹ reported that the COVID-19 pandemic had significantly affected their personal finances and retirement planning as well as increased

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burnout. A cross-sectional study of dental practitioners showed a decrease in work hours and practice income due to safety concerns of practicing during the COVID-19 pandemic.² Because dental anesthesiologists are exposed to infection risks from both dental and anesthesia procedures, it is probable that the COVID-19 pandemic has had a negative impact on them as well. However, the impact of the COVID-19 pandemic on the professional lives of dental anesthesiologists has not been examined. The primary objective of this study was to determine how the COVID-19 pandemic affected Japanese dental anesthesiologists' professional lives by assessing changes in income from prepandemic (2019) to the pandemic years (2020 and 2021). Secondary objectives included evaluating changes in job satisfaction and infection risk as dental anesthesiologists.

METHODS

This online cross-sectional survey was approved by the Research Ethics Committee of Kanagawa Dental University (No. 828, June 1, 2022). Subsequently, a request for research cooperation was submitted to and approved by the executive board of the Japanese Dental Society of Anesthesiology (JDSA).

This study was designed with reference to the survey of Girijanandan et al³ and was created using Google Forms. It consisted of an 18-item questionnaire in 7 sections related to the effects of COVID-19 on dental anesthesiologists' professional lives. Question items were discussed and developed by 4 dental anesthesiologists from 4 different academic hospitals. Before the survey was sent, the online questionnaire generated through Google Forms was tested to ensure it was working properly. Consent to participate in the study was obtained from each participant, and no personally identifiable information was collected.

The survey link was emailed to all JDSA board-certified dental anesthesiology specialists (BCDASs) with email addresses registered with the JDSA office on September 1, 2020. The data collection period lasted from September 1 to September 30, 2022. Participants were asked to respond to the survey only once. Reminder emails were sent twice during the data collection period, on September 15 and 29, 2022.

The primary endpoint of this study was a comparison in income before (2019) and during the pandemic years (2020 and 2021). Based on 2019 annual income, an increase or decrease of 5% or more was considered a significant change. The secondary endpoint was job satisfaction as a dental anesthesiologist, as determined using a numerical rating scale (NRS; 0 points, not satisfied at all; 10 points, the highest satisfaction imaginable). In addition, information regarding contracting COVID-19 during dental anesthesia procedures and concentrated contact with a person who tested positive for COVID-19 during dental anesthesia

procedures was collected as reference data. Contracting COVID-19 was defined as infection during clinical dental anesthesia as determined by the local public health centers under the jurisdiction of the Japanese Ministry of Health, Labour, and Welfare. Concentrated contact was defined as contact with a person who tested positive for COVID-19 for a certain period as determined by local public health centers.

Statistical Analysis

The change in income was compared using the χ^2 test or the χ^2 test with Yates' correction, as suitable. Job satisfaction as a dental anesthesiologist was presented as the median (IQR) and analyzed using the Kruskal-Wallis H test. All tests of significance were 2-sided, and $P < .01$ was considered indicative of statistically significant differences.

RESULTS

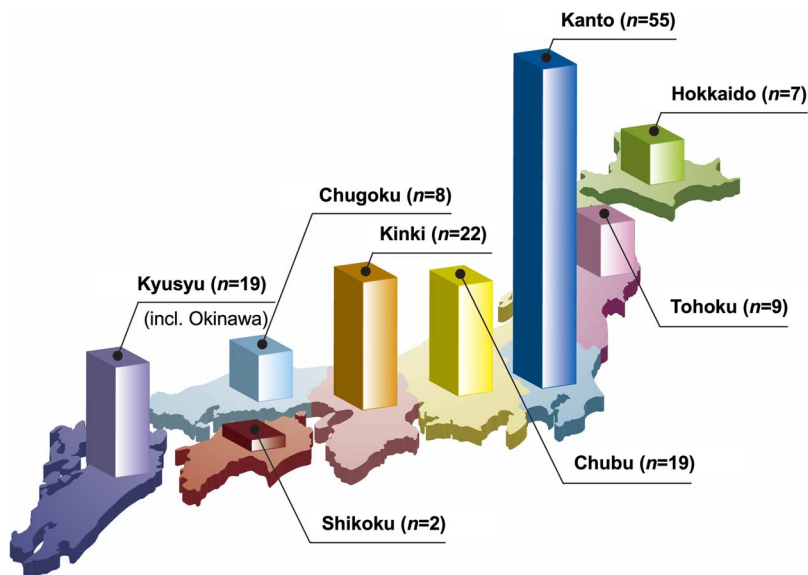
Of the 353 JDSA BCDASs, 2 had no email address on file with the JDSA office. The remaining 351 BCDASs were emailed survey invitations, 30 of which were returned with error messages (ie, undeliverable). A total of 141 respondents participated in this survey, for a response rate of 40.2% (141 of 351).

Demographic data of the study participants are presented in Table 1. Distribution of participants from the regions of main clinical practice (the 8 regions dividing Japan) is shown in Figure 1. The demographic and distribution data for the 141 study participants were similar to those of the 353 BCDASs of the JDSA. Therefore, the sample population of

Table 1. Respondent Demographics (N = 141)

<i>Characteristic</i>	<i>Value</i>
Gender, No. (%)	
Female	54 (38.3)
Male	87 (61.7)
Transgender	0 (0)
Decline to state	0 (0)
Age, median (IQR), y	48 (40–53)
Years in practice as dental anesthesiologist, No. (%)	
5–15	39 (27.7)
15–25	49 (34.8)
25–35	41 (29.1)
35–45	12 (8.5)
Primary site of dental anesthesia clinical practice, No. (%)	
Dental clinic	22 (15.6)
Dental hospital	60 (42.6)
General hospital	34 (24.1)
University hospital of medicine	6 (4.2)
Oral health center	10 (7.1)
Other	9 (6.4)

Figure 1. Map of Japan with a Regional Breakdown of Respondents



The distribution data for the 141 dental anesthesiologists who participated in the study were representative of all board-certified dental anesthesiologists of the Japanese Dental Society of Anesthesiology.

our study was deemed representative of the population of Japanese board-certified dental anesthesiologists.

Looking at changes in income relative to 2019, most respondents saw no change for 2020 or 2021 (58.9% vs 63.1%, respectively, a difference that lacked significance). Significantly more respondents reported decreased income in 2020 (39%) as compared with 2021 (21.3%), a difference of 17.7 percentage points ($P = .001$). Very few respondents reported increased income for 2020 (2.1%) as compared with significantly more for 2021 (15.6%, a difference of 13.5 percentage points; $P < .001$; Table 2).

In both 2020 and 2021, the largest number of respondents whose income changed relative to 2019 were those who saw decreases of 5% to less than 25%. The second largest group with income changes for 2020 were those with income decreases of 25% to less than 45%. In contrast, the second largest group with income changes for 2021 were those with income increases of 5% to less than 25% (Figure 2).

In contrast to income, which did see some changes for 2020 and 2021 relative to 2019, job satisfaction as a dental anesthesiologist as assessed by the NRS remained

unchanged at a median of 7 (IQR, 5–8) for all 3 years ($P = .109$; Table 3).

There was no significant difference in the number of dental anesthesiologists who reported becoming infected with COVID-19 during dental anesthesia clinical practice in 2020 and 2021 (2 vs 1, respectively; $P = .990$; Table 4). There was also no significant difference in the number of dental anesthesiologists who came into close contact with COVID-19 patients during dental anesthesia clinical practice in 2020 and 2021 (4 vs 6, respectively; $P = .747$; Table 4).

DISCUSSION

This online survey is the first study to describe the impact of COVID-19 on the professional lives of dental anesthesiologists. The major findings of the present survey are as follows: (1) many dental anesthesiologists have lost income because of the COVID-19 pandemic; (2) 21.3% of dental anesthesiologists were still reporting decreased income for 2021, although that number was lower than for 2020; and (3) job satisfaction remained unchanged as a result of the COVID-19 pandemic for dental anesthesiologists in Japan. These findings suggest that even though many Japanese dental anesthesiologist specialists lost income because of COVID-19, they maintained their job satisfaction.

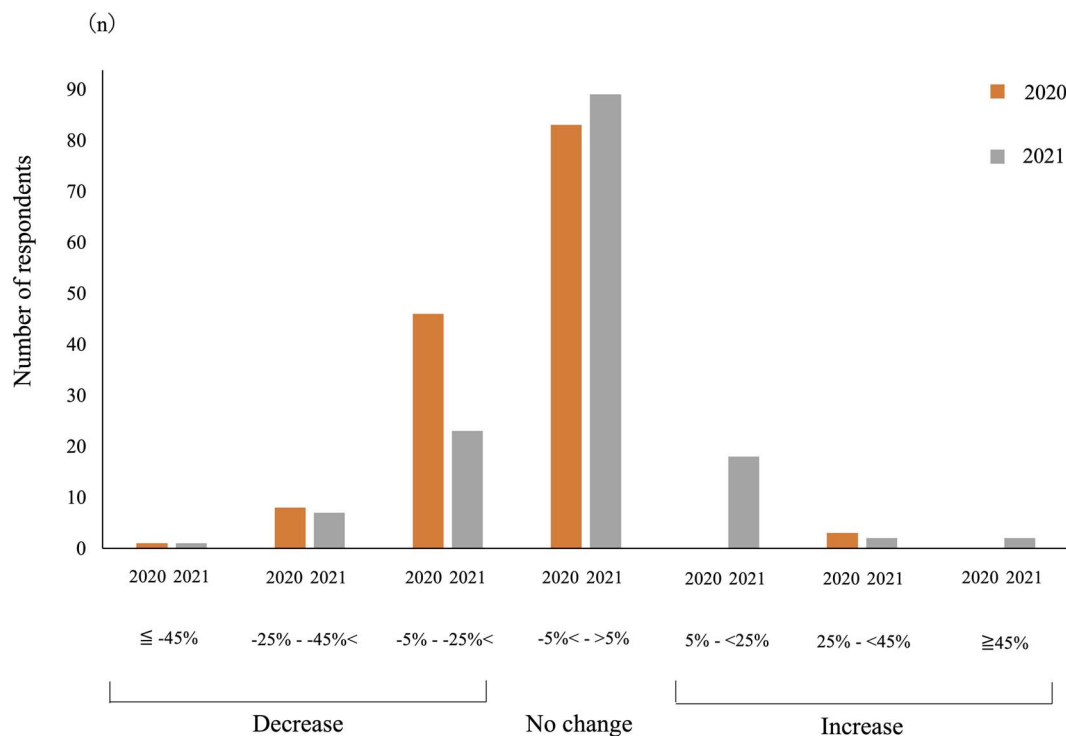
The COVID-19 pandemic has had a significantly negative financial impact on many health care providers. In a survey of pediatric anesthesiologists in the US, it was

Table 2. Income Changes Relative to 2019

	2020*	2021*	2020 vs 2021 P value
Decrease, No. (%)	55 (39.0)	30 (21.3)	.001
No change, No. (%)	83 (58.9)	89 (63.1)	.542
Increase, No. (%)	3 (2.1)	22 (15.6)	<.001

* vs 2019.

Figure 2. Distribution of the Degree of Income Change



In both 2020 and 2021, the largest number of respondents saw no change in income. The second largest groups for 2020 and 2021 were those whose income decreased by 5% to less than 25% as compared with 2019.

shown that approximately 60% of respondents reported a significant financial impact due to COVID-19, and the factor reported to have had the greatest impact was a change in incentive pay as an anesthesiologist.¹ In a survey of Egyptian endodontists, 84.39% of participants experienced a negative financial impact from COVID-19; 45% had a decrease in income over 10% but less than 25%, and an astonishing 37% had a decrease in income over 50% but less than 75%.⁴ In our study of Japanese dental anesthesiologists, approximately 40% and 20% of respondents in 2020 and 2021, respectively, reported an income decrease relative to 2019. The majority of those who saw a decrease in income were in the -5% to -25% range. Based on these findings, it appears that Japanese dental anesthesiologists were somewhat less adversely affected financially by COVID-19 than other health care professionals in foreign countries.

The salary structure of Japanese dental anesthesiologists affiliated with university hospitals (dental and medical), general hospitals, and public oral health centers includes incentive pay but is basically fixed. In April 2020, the Japanese government declared a state of emergency, and many

hospitals and clinics suspended medical treatments and surgeries for about a month. However, hospitals and universities still paid fixed salaries to health care providers during this time. As can be seen from this study’s demographic data, Japanese dental anesthesiologists are mostly affiliated with university hospitals (dental and medical), general hospitals, and public oral health centers. This may be the reason why they were less affected financially than other health care providers.

Declining job satisfaction in the health care profession can lead to burnout, stress, anxiety, depression, and decreased well-being.^{1,5} These issues can not only reduce the quality of health care, including the occurrence of medical errors and decreased productivity, but also cause increased turnover,^{1,6,7} making health care unsustainable. Peng et al⁸ confirmed that the COVID-19 pandemic significantly affected the job satisfaction of health care and other related professional staff. Ratiu et al⁹ reported that health care professionals reported increased death threats and lower job satisfaction than individuals in other occupations during the COVID-19 pandemic. However, the results of our study showed that Japanese dental anesthesiologists maintained their job satisfaction at the same level as before the COVID-19 pandemic.

Although several factors were reported to affect health care professionals’ job satisfaction during the pandemic, some studies showed that it was significantly associated with sufficient

Table 3. Job Satisfaction as a Dental Anesthesiologist

	2019	2020	2021	P value
Job satisfaction, median (IQR)	7 (5–8)	7 (5–8)	7 (5–8)	.109

Table 4. Infection Risk in Clinical Dental Anesthesia Practice

	2020	2021	P value
COVID-19 infection during clinical practice, No. (%)	2 (1.4)	1 (0.7)	.990
Concentrated contact during clinical practice, No. (%)	4 (2.8)	6 (4.3)	.747

resources to prevent the spread of COVID-19.^{10,11} At the beginning of the COVID-19 pandemic, there was global depletion of medical resources, including personal protective equipment (PPE) such as masks, gloves, and face shields as well as alcohol for disinfection. Although the adequacy of PPE for Japanese dental anesthesiologists was not investigated in this study, the fact that job satisfaction did not change potentially suggests that the supply was maintained.

Costa et al¹² reported that the infection rate of Brazilian anesthesiologists between June and July 2020 was 14.7%. Our survey data revealed that the reported infection rate of Japanese dental anesthesiologists was very low: 1.4% in 2020 and 0.7% in 2021. This low infection rate may also suggest that PPE resources for dental anesthesiologists in Japan were adequate.

The limitations of the present survey were as follows: (1) If respondents were busy with clinical dental anesthesia work, they may not have read or answered the question correctly. (2) Because this study included only participants who were BCDASs of the JDSA, it did not reflect residents who had yet to obtain specialty certification. (3) The validity and reliability of the questions used in this study and the sensitivity of the collected data were not analyzed. (4) No attempt was made to prevent multiple participation by respondents.

CONCLUSION

This survey's data demonstrated that although many Japanese dental anesthesiologist specialists lost income because of the COVID-19 pandemic, their job satisfaction was maintained. The results of this study should be used as a reference to help prepare dental anesthesiologists and health care policymakers as they plan for future pandemics.

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