

ORIGINAL ARTICLE

Greater impact of COVID-19 on peer-supported addiction services than government-owned services for addiction in Japan: A nationwide 3-year longitudinal cohort study

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Funding information

Ministry of Health, Labour and Welfare

Abstract

Aim: This study aims to investigate how the coronavirus disease (COVID-19) pandemic impacted service provision of peer-supported addiction services, such as self-help groups or recovery houses and government-owned addiction healthcare services, in Japan, as well as the quality of their interaction.

Methods: An online survey was distributed to all 69 public regional healthcare facilities (Mental Health and Welfare Centers [MHWCs]) across the 47 prefectures of Japan annually from 2021 to 2023, totaling three surveys. The survey asked about: (1) the current status of addiction healthcare services at each center, (2) the current status of peer-supported addiction services within each center's area, and (3) changes in connectivity between centers and peer-supported addiction services.

Results: All 69 centers participated in the survey each year. Following the second year of the pandemic, both MHWCs and peer-supported services experienced service closures and restrictions; however, peer-supported services were notably more affected nationwide, such as downsizing of services, decreased number of users, shortage of operation funds, and inability to connect with other services being widely reported ($p < 0.0001$). Despite the easing of most restrictions by the fourth year, MHWCs in 18 out of 47 prefectures reported at least one sustained negative impact on their service provision, while peer-supported services struggled to recover, with 40 out of 47 prefectures still observing difficulties.

Conclusion: The COVID-19 pandemic significantly affected both types of service, with peer-supported services facing greater challenges in recovery. Additional support is essential to restore these services to normal operation.

KEYWORDS

addiction, addiction healthcare service, impact of COVID-19, Japan, resource allocation

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INTRODUCTION

The novel coronavirus disease (COVID-19) profoundly impacted individuals with addiction. In Japan, a distinctive containment strategy was implemented, characterized by the absence of mandatory measures or penalties for noncompliance, unlike many other nations. Instead, citizens were urged to voluntarily adhere to government directives, including staying at home and maintaining social distance.¹⁻⁴ Despite the nonbinding nature of these measures, they effectively curtailed infection spread during the early pandemic phases.⁵ Information dissemination and related initiatives played pivotal roles in curbing infection transmission.⁶⁻⁸ Japanese citizens exhibited remarkable cooperation in altering their behavior to mitigate the virus spread,^{9,10} although some experts suggest that social pressures may have influenced compliance with nonmandatory directives.¹¹ Instances of community policing and social discrimination against noncompliers with government “requests” were prevalent,¹² contributing to the labeling of nonadherents as irresponsible.

Peer-supported addiction healthcare services (i.e., self-help groups and recovery houses), which serve as primary recovery avenues for many addiction sufferers, promote social gatherings and connections, contradicting infection containment measures. Consequently, Japanese specialists voiced concerns that COVID-19 “social distancing” campaigns might exacerbate addiction symptoms,^{13,14} potentially fostering social isolation and disconnecting individuals from vital recovery resources.

Especially in Japan, alcohol industries, such as bars and cabaret clubs, as well as gambling-related industries centered on pachinko, have been strongly criticized as venues responsible for spreading the infection.^{15,16} These events were assumed to strengthen the prejudice against people who suffer problems related to addiction, acting as deterrents to disclose their problem and seek support. Notably, specialists reported the presence of binge drinking,¹⁷ possible exacerbation of hazardous alcohol drinking among men,¹⁸ increased hospital admission rates of alcohol-related liver disease or pancreatitis for women,¹⁹ increased risk of relapse among people with methamphetamine addiction who are not abstinent,²⁰ and increased internet and smartphone use and gaming behavior following the onset of the pandemic among patients diagnosed with gaming disorder.²¹ These issues, alongside service closures and restrictions, significantly impacted addiction healthcare services.²² Given the exacerbated stigma surrounding addiction healthcare services during the pandemic, certain services may have been presumed to suffer disproportionately, despite the easing of most restrictions. Peer-supported services may especially require additional support to restore pre-pandemic operations, as these services often rely on public backup. Still, a longitudinal assessment of the pandemic-related impact on these services is scarce.

The current study aims to provide insight into balancing infection control measures with the maintenance of essential services in future pandemics, based on a longitudinal nationwide survey that examines the real-world impact of the COVID-19 pandemic on addiction service provision. The survey monitored both government-owned and peer-supported addiction healthcare services in Japan during the COVID-19

era. We hypothesize regional disparities in the impact of government-owned and peer-supported services, as infection rates, timing, and intensity of response measures, such as lockdowns and suspensions of social gatherings, varied across regions.²³ The gap between the detection of the first infection among prefectures was as long as 6 months and confirmed COVID-19 cases were highly concentrated in large urban areas.²³ Considering these factors, we aim to uncover accurate data that stakeholders and policy-makers can utilize in their decision-making.

METHODS

Study design

This study employed a nationwide 3-year longitudinal design. According to the Japanese Act on Mental Health and Welfare for the Mentally Disabled, all 47 prefectures and Ordinance Designated Cities (cities with a population exceeding 500,000 and designated as such by the Cabinet of Japan under Article 252, Section 19, of the Local Autonomy Law) are mandated to establish Mental Health and Welfare Centers (MHWCs). These centers serve to enhance the mental health and welfare of individuals with mental disorders or disabilities. Beyond offering individual consultations, group therapy programs, and family support groups for various addiction issues, MHWCs are also required by law to act as central hubs supporting local peer-supported services (e.g., recovery houses, daycare facilities, self-help groups), fostering collaboration within their respective areas. With a total of 69 MHWCs across Japan, these centers regularly compile information on available services within their jurisdictions, making them an ideal resource for gathering nationwide data on addiction healthcare services.

An initial qualitative survey was distributed to all 69 MHWCs in October 2020, coinciding with the first year of the COVID-19 pandemic. The survey sought information on the observed impacts of the pandemic related to (1) the operational status of addiction services at each center, (2) the operational status of peer-supported services within each center's jurisdiction, and (3) the quality of interactions between MHWCs and peer-supported services in their areas. Details of the initial survey are available in a separate research article.²² Based on qualitative analysis of the responses, a quantitative survey was developed to systematically measure the nationwide impact of COVID-19. This subsequent survey, administered annually from October 2021 to 2023, utilized a structured format derived from the initial qualitative findings. The survey asked each center the (1) operation status of the one-on-one consultation service ([a] temporal suspension of the service, [b] shifting to online instead of face-to-face sessions, [c] downsizing of service, either of time or limited number of cases), (2) operation status of group therapy programs ([a] temporal suspension of the service, [b] cancellation of invited staff to the program, [c] changing the schedule of program, [d] shifting to online instead of face-to-face sessions, [e] downsizing of service, either of time or limited number of attendants), (3) operation status of family group therapy programs ([a] temporal suspension of the service, [b] cancellation of invited staff to the program, [c] changing the schedule of program, [d] shifting to online instead of face-to-face sessions, [e] downsizing of

service, either of time or limited number of attendants), (4) observed negative impact of the peer-supported services in their jurisdiction ([a] downsizing of service, either of time or limited number of cases, [b] shortage of operation funds, [c] unable to conduct outreach services, [d] cannot hold meetings due to curfew restriction in the area, [e] decreased number of users, [f] unable to hold meeting due to restriction on public space usage), and (5) observed negative impact on the connection with peer-supported services in the area ([a] unable to hold meetings with the staff of peer-supported services, [b] unable to understand the current situation of the peer-supported services in the area, [c] unable to contact the peer-supported services in the area, [d] unable to refer their clients to the peer-supported services in the area). The options for each question are also listed in Figure 1.

The survey was disseminated via email to all 69 MHCs, with responses requested regarding impacts observed in each preceding year across the three aforementioned domains, using September 1st of each year as the reference point. The survey was conducted using the online network to which all MHCs belong, with approval from the MHC board committee. As the surveys did not collect personal data but rather sought general situational reports from each area, the answers were collected via registered style and were not anonymous. We asked for each center's person in charge of addiction healthcare service to answer the survey. As a routine, the

answers of these surveys are also normally checked and approved by the head of each center before being submitted. Figure 2 provides a detailed timeline of the survey and relevant events during the COVID-19 pandemic.

Data analysis

Initially, response totals were computed for each year's survey to assess the overall impact. We defined the regional impact on government-owned services as an affirmative response to any of the questions from (1) to (3). Specifically, if a certain MHC reported difficulties in any of their one-on-one consultation services, group therapies, or family support programs, we assumed that the MHC in that region had experienced an impact. For peer-supported services, regional impact was defined as affirmative responses to any of the questions from (4) and (5). Thus, if a certain MHC discovered difficulties in the peer-supported service and/or connection with a certain service within the jurisdiction, we assumed that the peer-supported service in their jurisdiction had experienced an impact. For further analysis, responses from MHCs in Ordinance Designated Cities were combined with those from MHCs in the prefecture where the sites are located, considering any reported impacts in either entity within the past year as indicative of impact at the prefectural

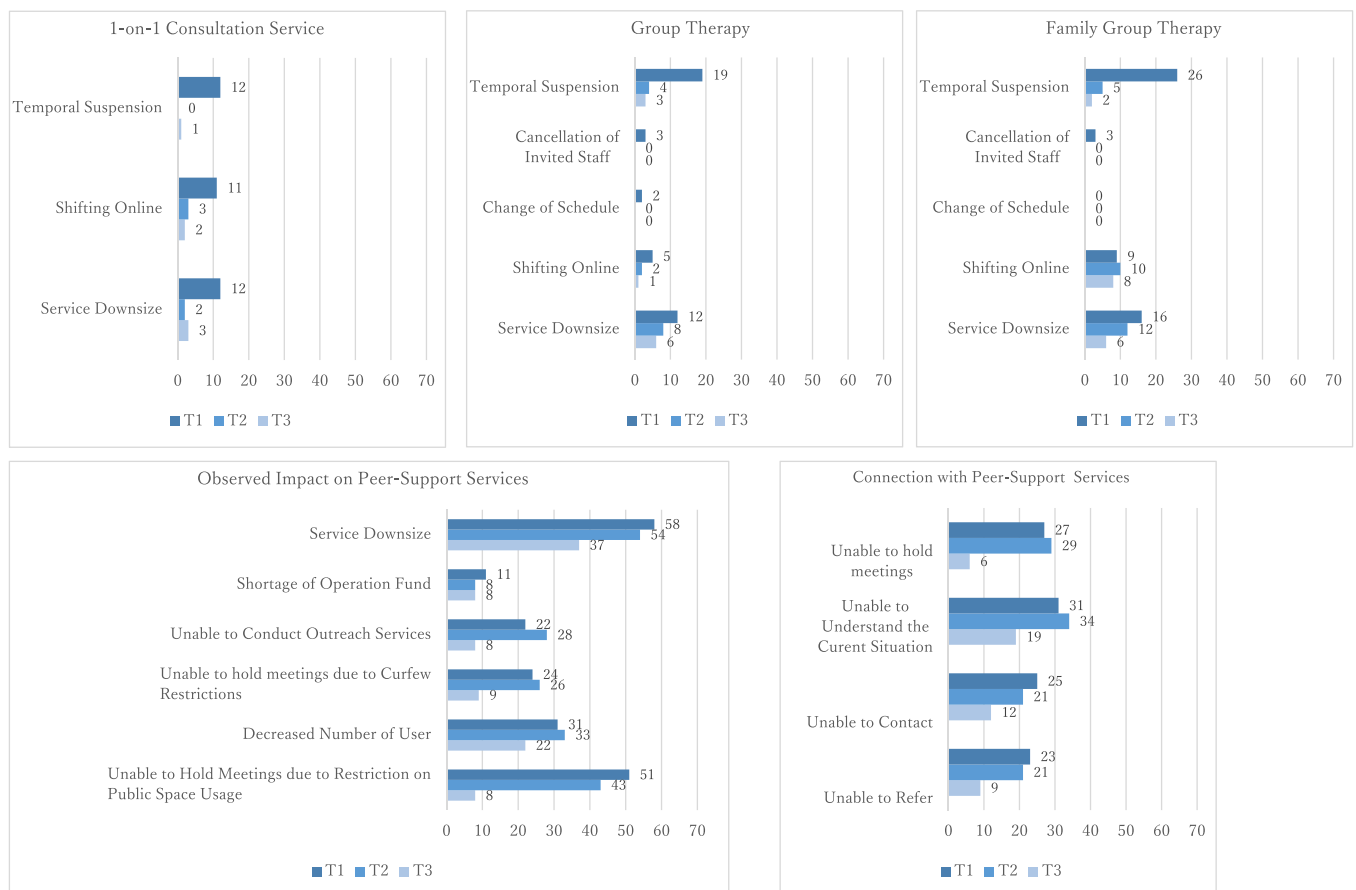


FIGURE 1 Observed impact of COVID-19 according to survey questions.

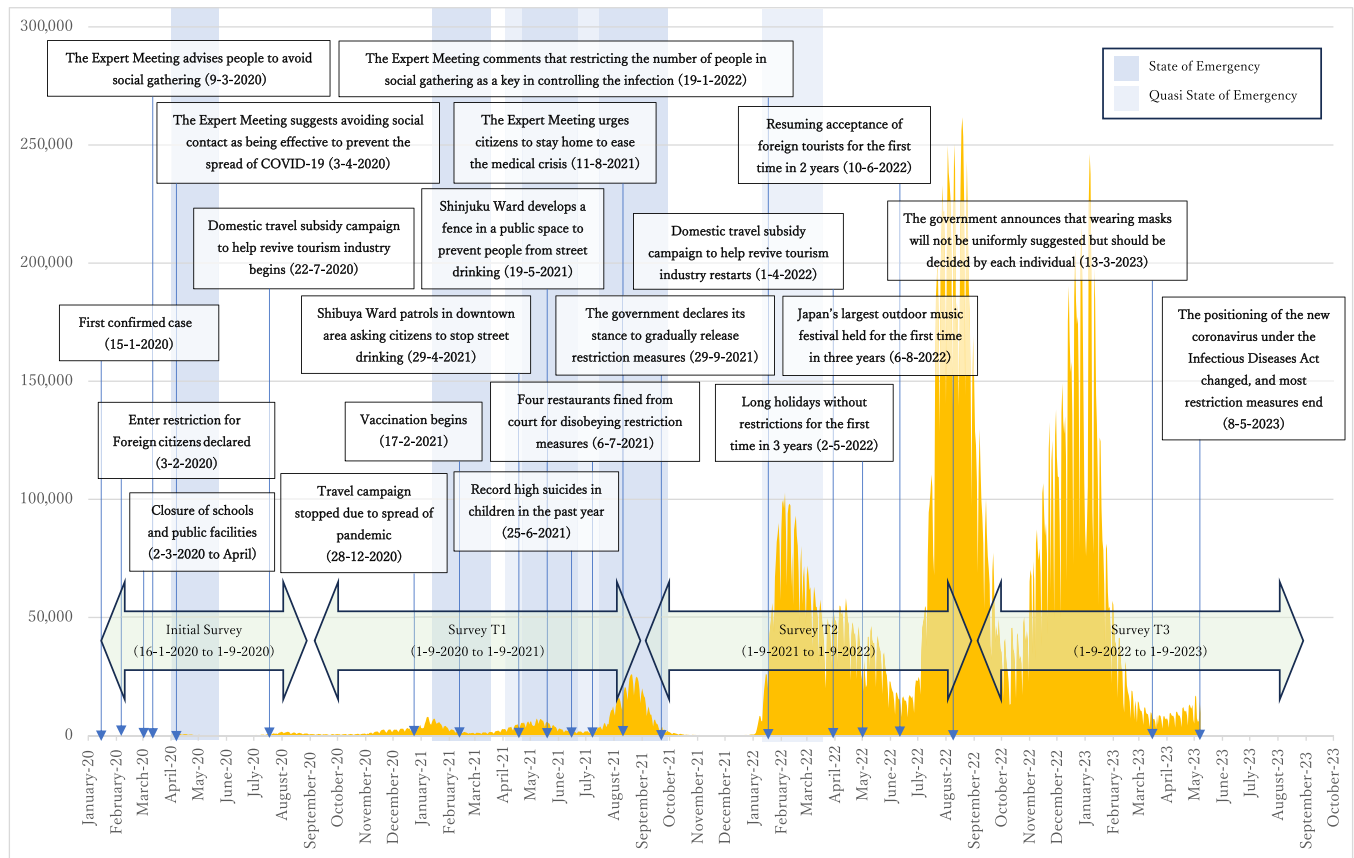


FIGURE 2 Daily confirmed cases of COVID-19 in Japan, related domestic events, and the schedule of the present study. Information retrieved from <https://www3.nhk.or.jp/news/special/coronavirus/chronology/?mode=all&target=latest>

level. This approach accounted for the decentralized nature of COVID-19 infection control across prefectures, ensuring an accurate assessment of nationwide impacts without overestimation. Prefectural mappings were generated to visualize impact presence annually.

Subsequently, a generalized linear mixed model (GLMM) analysis was conducted to examine differences in COVID-19 impacts between government-owned and peer-supported services each year. The presence of impact served as the dependent variable, while the independent variables were group (government-owned or peer-supported services) and time (T1: September 1, 2020 to September 1, 2021; T2: September 1, 2021 to September 1, 2022; T3: September 1, 2022 to September 1, 2023). Region (Hokkaido and Tohoku Region, Kanto Region, Chubu Region, Kansai Region, Chugoku Region, Shikoku Region, Kyushu, and Okinawa Region) was included as a random effect to account for regional variations in infection rates and mitigation measures. Two GLMM analyses were conducted: one hypothesizing a Group \times Time interaction effect (Model 1) and another without hypothesizing such an interaction (Model 2). The significance level was set at 0.05, and the Akaike information criterion (AIC) was utilized to compare model fits. Statistical analyses were performed using R.²⁴ GLMM was executed with the “lme4” and “lmerTest” packages.

RESULTS

Changes in impact over time

All 69 MHCs responded to our survey each year, resulting in a response rate of 100%, with no missing data. Figure 1 illustrates the comprehensive responses from centers to each survey question. The number of temporal suspensions for one-on-one consultation services provided by MHCs was 12 for the second year (T1: September 1, 2020 to September 1, 2021), 0 for the third year (T2: September 1, 2021 to September 1, 2022), and 1 for the fourth year (T3: September 1, 2022 to September 1, 2023). The number of temporal suspensions for group therapies in each year was 19, 4, and 3, respectively. The number of temporal suspensions for family group sessions in each year was 26, 5, and 2, respectively. MHCs that observed downsizing of peer-supported services were 58 for the second year (T1), 54 for the third year (T2), and 37 for the fourth year (T3). Shortage of operation funds among peer-supported services was also found in several MHCs throughout the research period (second year [T1]: 11 MHCs, third year [T2]: eight MHCs, fourth year [T3]: eight MHCs). The number of MHCs that experienced difficulties in grasping the current condition of peer-supported services in the area was 31, 34, and 19, respectively.

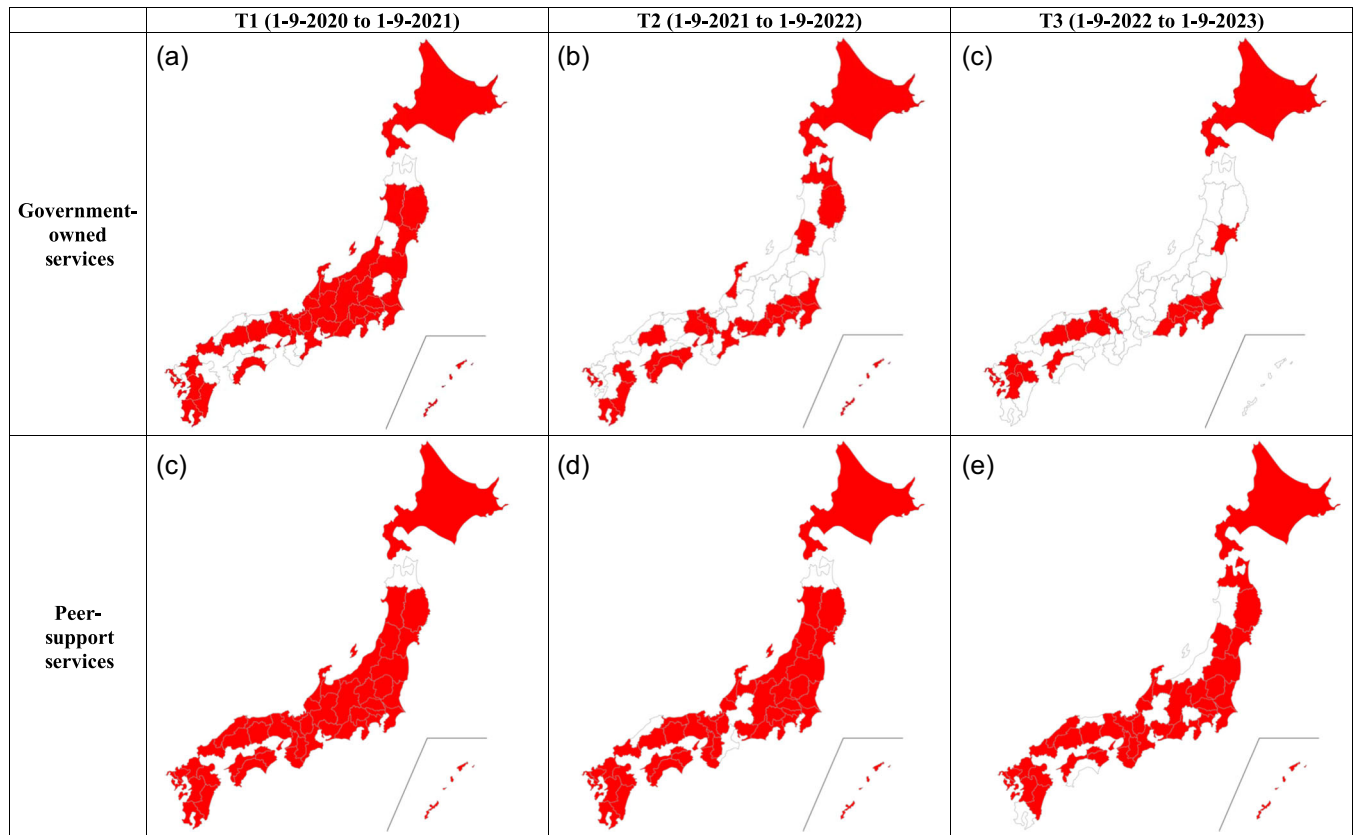


FIGURE 3 Prefectural mapping of the impact. Prefectures that observed at least some impact from COVID-19 during the time are colored in red.

Mapping the impact

Figure 3 visually represents the nationwide impact of COVID-19 on government-owned and peer-supported services. Prefectures experiencing impacts are highlighted in red, indicating varying levels of impact across the years. Thirty-six out of 47 prefectures experienced some impact on government-owned services due to COVID-19 in the second year (T1) of the pandemic (Figure 3a). By the third year (T2), 26 out of 47 prefectures experienced some impact on government-owned services due to COVID-19 (Figure 3b). By the fourth year (T3), this number decreased to 18 (Figure 3c). Among peer-supported services in the prefecture, 46 out of 47 prefectures observed at least one impact on peer-supported services in their prefecture by the second year (T1) of the pandemic (Figure 3d). By the third year (T2), 43 out of 47 prefectures observed some impact on peer-supported services due to COVID-19 (Figure 3e). By the fourth year (T3), 40 prefectures still observed some impact on peer-supported services in their area (Figure 3f).

GLMM analysis

Table 1 presents the GLMM results examining the relationship between COVID-19 impacts, time, and group. In the first model with

a Group \times Time interaction effect, peer-supported services had an odds ratio of 14.3 for being impacted by COVID-19 compared to government-owned services (coefficient = 2.6597, 95% confidence interval [CI: 0.9498, 5.5902], p value = 0.0128). The change in impact over time and the Group \times Time interaction were not statistically significant, with an AIC of 268.4.

In the second model not hypothesizing a Group \times Time interaction effect, peer-supported services had an odds ratio of 9.85 for being impacted by COVID-19 compared to government-owned services (coefficient = 2.2878, 95% CI [1.6024, 3.0508], p value < 0.0001). COVID-19 impacts had an odds ratio of 0.35 for decreasing in the third year (T2) compared to the second year (T1) (coefficient = -1.0580, 95% CI [-1.9064, -0.2560], p value = 0.0114) and an odds ratio of 0.17 for decreasing in the fourth year (T3) compared to the second year (T1) (coefficient = -1.7500, 95% CI [-2.6025, -0.9608], p value < 0.0001). The AIC was 264.5, indicating Model 2 as a better fit based on statistical analysis.

DISCUSSION

This study presents a unique contribution as the first of its kind to investigate the longitudinal impact of COVID-19 on both government-owned and peer-supported addiction services nationwide in Japan

TABLE 1 Results of generalized linear mixed model analysis.

Model	Variable	Coefficient (log odds ratio)	95% CI	Z score	p value	Odds ratio
1	Peer-support services	2.6597	[0.9498, 5.5902]	2.489	0.0128*	14.3
AIC: 268.4	T2 vs T1	-1.4587	[-4.4542, 0.5032]	-1.282	0.2000	
	T3 vs T1	-2.0956	[-5.0473, -0.3065]	-1.921	0.0548	
	Interaction (Government-owned × T2)	0.4696	[-1.7030, 3.5613]	0.383	0.7018	
	Interaction (Government-owned × T3)	0.4020	[-1.6356, 3.4518]	0.339	0.7344	
2	Peer-support services	2.2878	[1.6024, 3.0508]	6.235	<0.0001*	9.85
AIC: 264.5	T2 vs T1	-1.0580	[-1.9064, -0.2560]	-2.530	0.0114*	0.35
	T3 vs T1	-1.7500	[-2.6025, -0.9608]	-4.203	<0.0001*	0.17

Abbreviations; AIC, Akaike information criterion; CI, confidence interval.

* $p < .05$, T1: September 1, 2020 to September 1, 2021, T2: September 1, 2021 to September 1, 2022, T3: September 1, 2022 to September 1, 2023.

throughout the pandemic. Achieving a 100% response rate each year adds to the reliability of our results, highlighting the substantial impact of COVID-19 on healthcare delivery for individuals grappling with addiction. Although all services faced challenges during the COVID-19 era, group-style programs were relatively more affected among government-owned services. Furthermore, our study revealed that various domains of peer-supported services endured a significantly more severe impact and continue to face challenges even after the relaxation of many pandemic measures.

During a pandemic where public resources undergo significant allocation, peer-supported healthcare services, in general, are known to not only endure more difficulties but also experience prolonged recovery challenges.²⁵ The current study further demonstrates that peer-supported addiction services are less resilient to a nationwide pandemic in terms of their service provision. Considering the stigmatizing nature of addiction, it may even be reasonable to assume that the situation is worse compared to other peer-supported mental health services. A German study assessing public preferences regarding resource allocation for COVID-19 care found alcoholism to be the least popular choice for sustained care, with only 8% of respondents supporting continued care for the condition.²⁶ Similarly, US residents exhibited limited support for sustained care for individuals with substance use disorder during the pandemic, as evidenced by a large-scale survey.²⁷ Specialists cautioned during the pandemic's early stages that resource allocation might negatively impact individuals suffering from addiction.²⁸ Resource allocation in healthcare was a global occurrence during the COVID-19 era, with scant attention given to the impact or whether this allocation was offset. Addiction is often stigmatized, and resources that were diverted may not always be reclaimed in the absence of ample backing from the scientific community. Our data not only corroborate these concerns with rigorous scientific evidence but also suggest that the impact was unequal across services, with the situation not aligning with the pandemic progression.

One of our study's objectives is to alert the international community regarding addiction healthcare services, suggesting that such a situation may not be unique to Japan but may be prevalent in other nations. Previous studies suggest that the government's discouragement of social gatherings to curb infection spread may have made people

hesitant to reach out for addiction healthcare services, as well as facilities' decision to temporarily suspend the provision of such programs.^{29,30} Our results imply that the impact services face during such pandemics results from a multifaceted interplay between resource allocation, societal perceptions of addiction, and legal frameworks governing services. Given the arduousness and timeliness of our study, the current study uniquely underscores the imperative for international policy-makers and stakeholders to safeguard addiction healthcare services from the COVID-19 pandemic's impact. This is vital to the well-being of individuals struggling with various addictions, while also averting similar pitfalls in future crises. Equity stands as a foundational principle in service allocation,³¹ thus our study offers insights into how such allocations should be made while adhering to this principle.

In concrete terms, we suggest stakeholders and local government leaders carefully monitor the situation of each peer-supported service in the area and provide additional support according to the needs of each service. For example, many services were forced to adapt to the situation during the pandemic, resulting in the rapid development of online meetings and relocations which align with the pandemic's prevention measures.³²⁻³⁵ Although such modifications were generally helpful in assuring the continuity of services to people in need, these newly provided services also faced significant challenges, such as a lack of digital equipment and knowledge in the users, people's distrust in the efficacy of such services, and lack of information on how and when these modified services are provided.^{22,36} Considering that these factors may have acted as deterrents in people's access to peer-supported services as shown in our study, additional support, such as public awareness campaigns advocating understanding of recovery activities and providing information on service provision, as well as constant communication between government-owned services and peer-supported services may be important in maintaining these newly developed services and bolstering people's access to various addiction services in the post-pandemic era.

As Hari famously stated, "The opposite of addiction is connection," underscoring the importance of social connections in recovery endeavors.³⁷ Healthcare professionals and support networks must therefore acknowledge the natural course of addiction healthcare services

during the pandemic, and prioritize communication and collaboration to forestall further institutional disconnection that could lead to isolation among individuals with addiction. Social pressures escalated within the alcohol and gambling-related industries during the pandemic, compounded by Japan's preexisting cultural inclination towards conformity, which, while beneficial in containing infections without penalties, also led to disconnection and heightened stigma towards people who do not comply for various reasons.¹² We believe that cultivating an "addiction-informed" community by application of the presented measures is crucial in bolstering the resilience of addiction healthcare services, where sustained support and comprehension of addiction-recovery-promoting activities can be exhibited. Policy-makers should be mindful of the risk that various societal policies and media coverage carried out in society during the pandemic's spread may further exacerbate addiction, a condition highly susceptible to stigma.

Limitations

Indirect data collection about peer-supported services may not fully capture the severity of their situations, and the focus on impact occurrence rather than severity requires caution in interpretation. Each facility's unique challenges warrant individualized analysis beyond this broad overview. Moreover, our study's focus on Japan necessitates similar studies in other countries to generalize our findings and understand global trends in addiction healthcare service impacts during pandemics.

CONCLUSION

This study unveils the extensive longitudinal repercussions of COVID-19 on healthcare provision for individuals with addiction in Japan. Both government-owned and peer-supported services faced significant challenges during the pandemic, with peer-supported services enduring a comparatively greater struggle even after the relaxation of infection-control measures. To foster resilience in peer-supported services and rebuild a robust addiction support network in the post-pandemic era, additional support is imperative. This includes measures to enhance peer-supported services' resilience, foster active communication among stakeholders, and implement public campaigns that promote understanding and support for recovery activities, thus fostering stronger connections within the addiction support community.

AUTHOR CONTRIBUTION

Munenori Katayama: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; visualization; writing—original draft preparation; writing—review and editing. **Sou Fujishiro:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; supervision; writing—review and editing. **Kanna Sugiura:** Conceptualization; methodology; project administration; writing—review and

editing. **Ken Inada:** supervision; writing—review and editing. **Jun Konishi:** formal analysis; methodology; software; visualization; writing—review and editing. **Norihito Shirakawa:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; project administration; resources; supervision; writing—review and editing. **Toshihiko Matsumoto:** Funding acquisition; project administration; supervision; writing—review and editing.

ACKNOWLEDGMENTS

This study was supported by research grants from the Japanese Ministry of Health, Labour, and Welfare.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data used in this study can be accessed through correspondence with the lead author.

ETHICS APPROVAL STATEMENT

This study was approved by the Zenkoku Seishin Hoken Fukushima Center Head Committee (Head Committee of Japan's Mental Health and Welfare Center).

PATIENT CONSENT STATEMENT

Informed consent was obtained from all participants in the study in written form.

CLINICAL TRIAL REGISTRATION

N/A

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How to cite this article: Katayama M, Fujishiro S, Sugiura K, Konishi J, Inada K, Shirakawa N, et al. Greater impact of COVID-19 on peer-supported addiction services than government-owned services for addiction in Japan: a nationwide 3-year longitudinal cohort study. *Psychiatry Clin Neurosci Rep*. 2024;3:e70012. <https://doi.org/10.1002/pcn5.70012>